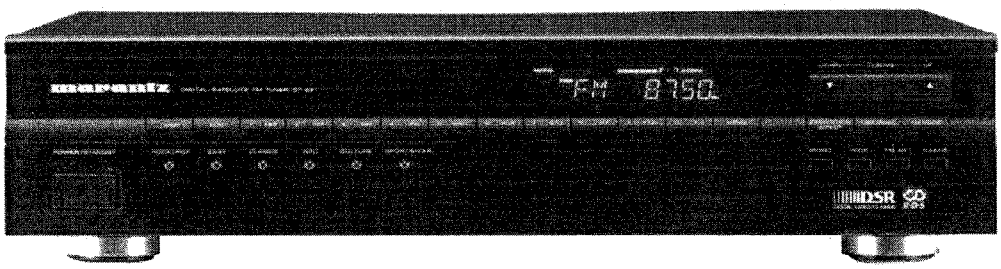
Service Manual

74 ST83/02B/02G

Digital Satellite FM Tuner



Model 74 ST83/02B

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marantz®

model ST-83

First issue : 1994

4822 725 51049

PCS 71 937

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ company has created the ultimate in stereo sound. Only **original MARANTZ parts** can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ equipment are generally available at our National Marantz Subsidiary or Agent.

MARANTZ EUROPE B.V.
P.O. Box 80002
Building SFF 2
5600 JB Eindhoven
The Netherlands
Phone : +31-40-732241
Fax : +31-40-735578

ORDERING PARTS

Parts can be ordered either by mail or by telex. In both cases, the correct part number has to be specified. The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which the part is required
5. Way of shipment
6. Signature: any order form or telex must be signed, otherwise such part order will be considered as null and void.

ADDRESSES

AUSTRALIA
MARANTZ AUSTRALIA
Figtree Drive
Australia Centre
Homebush, NSW 2140
AUSTRALIA

AUSTRIA
MARANTZ
Hietzinger Kai 137a
1130 Wien
Austria

BELGIUM
MARANTZ EUROPE B.V.
Div. Benelux
P.O.Box 80002
Building SFF 2
5600 JB Eindhoven
The Netherlands

CHILE
MARANTZ DIVISION OF
PHILIPS S.A.
Av.Santa Maria 0760
Casilla 2687
Santiago
Chile

DENMARK
MARANTZ
Horsvinget 5
2630 Tastrup
Denmark

FINLAND
MARANTZ
Kuortanegatan 1
00520
Helsingfors 52
Finland

FRANCE
MARANTZ FRANCE
4 Rue Bernard Palissy
92600 Asnières
France

GERMANY
MARANTZ GERMANY GmbH
Kleine Heide 12
Postfach 4802
Halle-Westfalen
Germany

GREAT BRITAIN
MARANTZ HiFi UK Ltd.
Kingsbridge House
Padbury Oaks
575-583 Bath Road
Longford Middlesex UB7 OEH,
U.K.

GREECE
ADAMCO ELECTR. SA
P.O.Box 21025
Hippocratus Str. 188
Athens 11471
Greece

ITALY
MARANTZ ITALIANA SPA
Piazza IV Novembre 3
20124 Milano
Italy

JAPAN
MARANTZ JAPAN INC.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

KUWAIT
AL ALAMIAH ELECTRONICS
P.O.Box 8196
Salmiah
22052 Kuwait

NETHERLANDS
MARANTZ EUROPE B.V.
Div. Benelux
P.O.Box 80002
Building SFF 2
5600 JB Eindhoven
The Netherlands

NORWAY
MARANTZ
Postboks 7034
Assiden
3007 Drammen
Norway

PORTUGAL
COREL
Av. da Liberdade
211-2 Esq.
1200 Lisboa
Portugal

SAUDI ARABIA
AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
Saudi Arabia

SOUTH AFRICA
MARANTZ S.A.
10 Bond Street
Randburg 2194
P.O. Box 7703
Johannesburg 2000
South Africa

SPAIN
MARANTZ SPAIN
Martinez Villergas 2
Apartado 2065
Madrid 28027
Spain

SWEDEN
MARANTZ
Box 1324
17125 Solna
Sweden

SWITZERLAND
MARANTZ SWITZERLAND
Postfach
8010 Zürich-Müllingen
Switzerland

TRADING
MARANTZ TRADING
P.O.Box 20008
Building SFF 2
5600 JB Eindhoven
The Netherlands

All of the above locations are fully equipped to take care of your total service needs or can advice you. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please contact the nearest facility for the necessary assistance.

In case of difficulties, do not hesitate to contact the Technical Department at above mentioned address.

SPECIFICATION

DSR:

RF:

Input frequenzy range		: 50-850 MHz
Capture range		: ± 450 kHz
AFC		: ± 6 MHz
Input voltage C/N	> 10 dB	: 48 dBµV - 94 dBµV
Bit error rate (BER)	> 10 dB	: ≤ 10^{-3}
Raster fine-tuning		: 62.5 kHz / step

AF:

Sampling frequency		: 32 kHz
D/A conversion		: 20 bit 256-times oversampling
Speech/music control		: max. - 21 dB in 7 steps

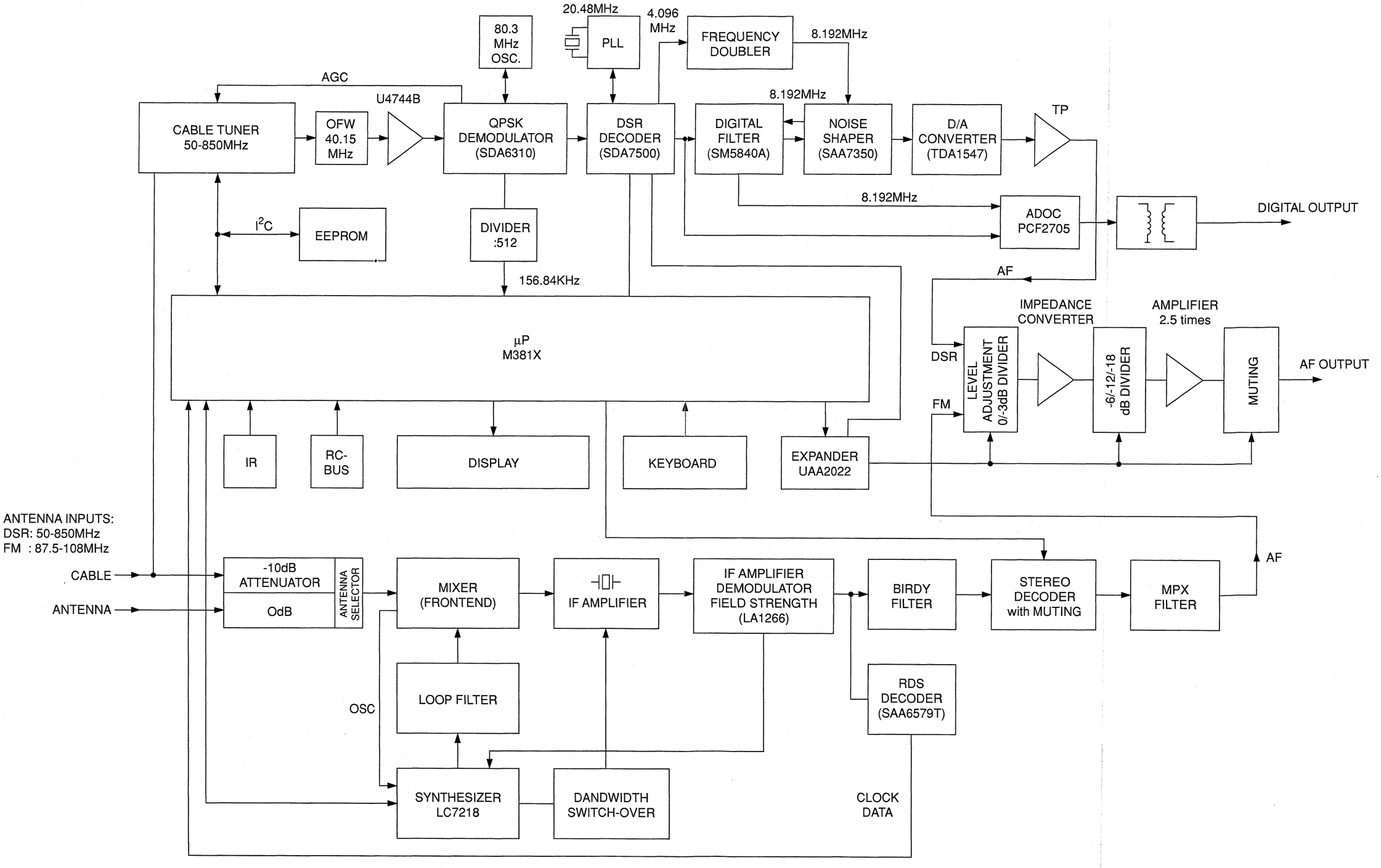
AF-output:

Output voltage		: 2 V
Output impedance		: 500 Ω
Level difference		: ≤ 0.5 dB
Frequency response	20 Hz - 14.5 kHz	: ± 0.2 dB
	14.5 - 15 kHz	: - 1.5 dB
S/N ratio unweighted		: ≥ 98 dB
Dynamic range		: ≥ 95 dB
Distortion factor	20 Hz - 15 kHz	: ≤ 0.006 %
Stereo channel separation		: ≥ 90 dB

FM:

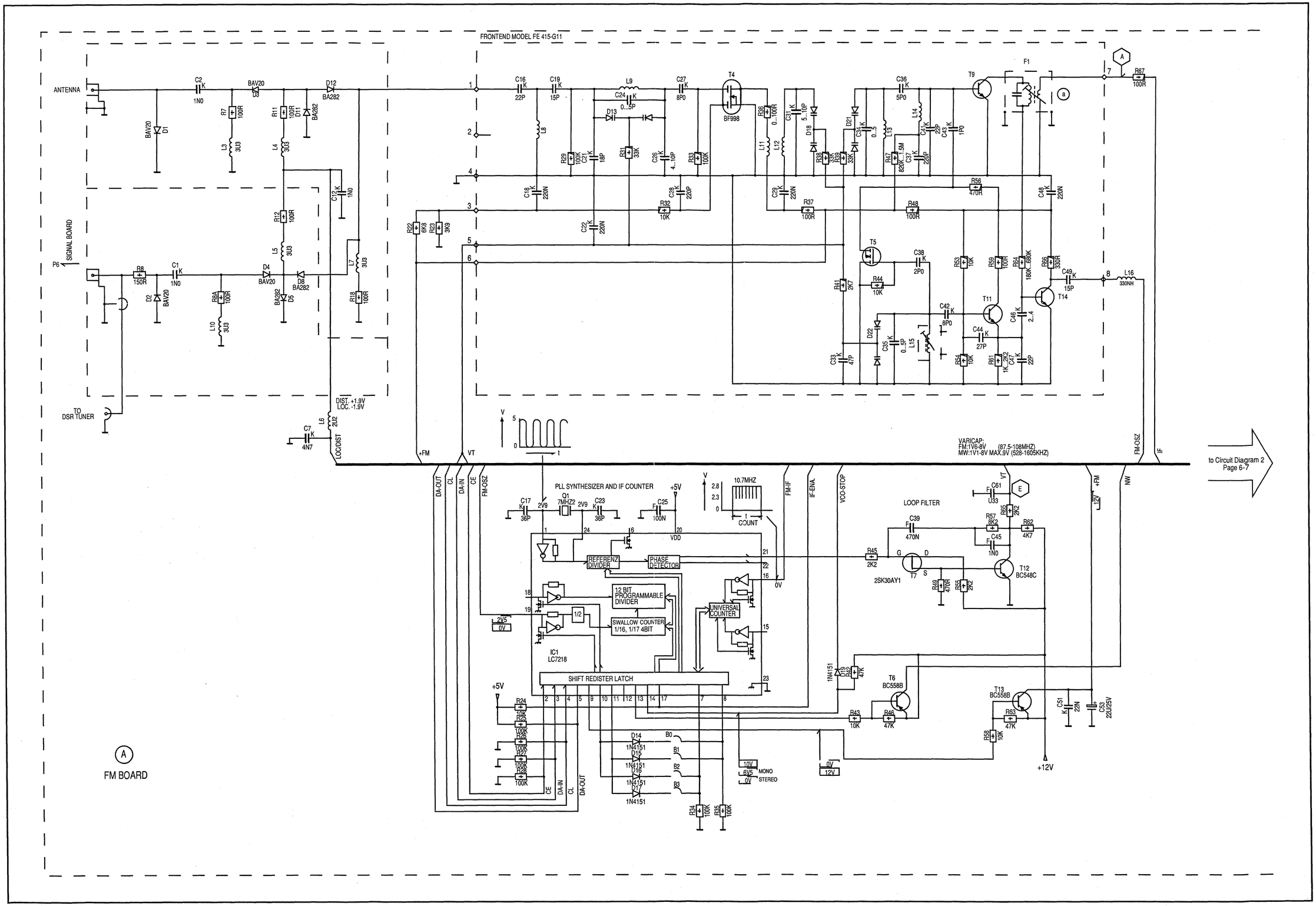
Input frequency range		: 87.5-108 MHz
Tuning steps search mode		: 50 kHz
Tuning steps manual mode		: 25 kHz
Sensitivity (40 kHz deviation)	Mono	
	(antenna / cable)	: 1 µV / 3 µV at 26 dB S/N
	Stereo	
	(antenna / cable)	: 35 µV / 100 µV at 46 dB S/N
IF-bandwidth	(narrow / wide)	: 120 kHz / 160 kHz
Dynamic selectivity		
(± 300 kHz; 40 kHz dev.; - 30 dB noise)	Mono	
	(narrow / wide)	: ≥ 70 dB / ≥ 50 dB
	Stereo	
	(narrow / wide)	: ≥ 70 dB / ≥ 50 dB
Capture ratio	40 kHz deviation	: 1.5 dB
	75 kHz deviation	: 2.0 dB
Signal to noise ratio		
(22 Hz - 15 kHz; 40 kHz + 7.5 kHz		
deviation; fe = 98 MHz; RF-level 1 mV)	Mono	
	(unweighted / weighted)	: ≥ 70 dB / ≥ 73 dB
	Stereo	
	(unweighted / weighted)	: ≥ 67 dB / ≥ 69 dB
Frequency response	(- 3 dB)	: ≤ 10 Hz - 16 kHz
Distortion factor (40 kHz deviation)	Mono	
	(narrow / wide)	: ≤ 0.25 % / ≤ 0.2 % (1 kHz)
	Stereo	
	(narrow / wide)	: ≤ 0.7 % / ≤ 0.4 % (1 kHz)
Crosstalk (40 kHz deviation)	(narrow / wide)	: ≥ 30 dB / ≥ 40 dB (1 kHz)
Output voltage (40 kHz deviation)		: 1.0 V (1 kHz)
Level control		: max. - 21 dB in 7 steps

1. BLOCK DIAGRAM

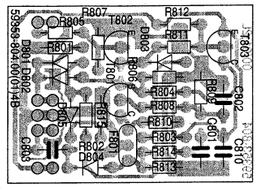


2. SCHEMATIC DIAGRAM AND PCB´S

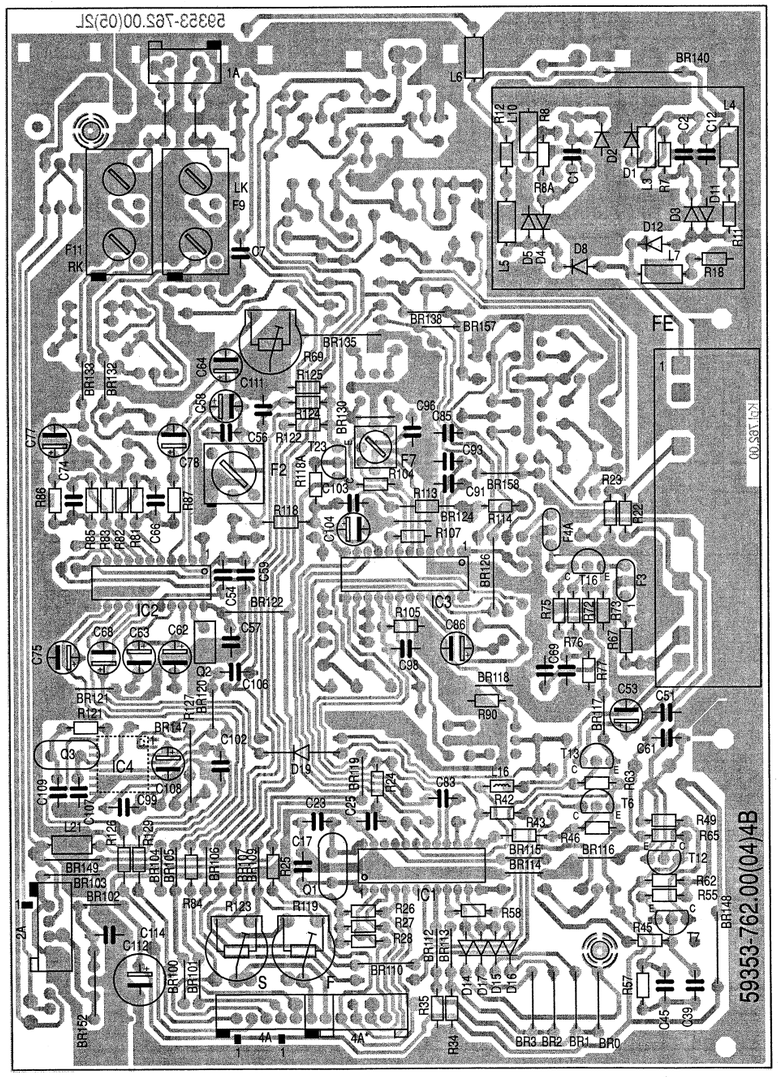
2.1 SCHEMATIC DIAGRAM FM TUNER - PART 1



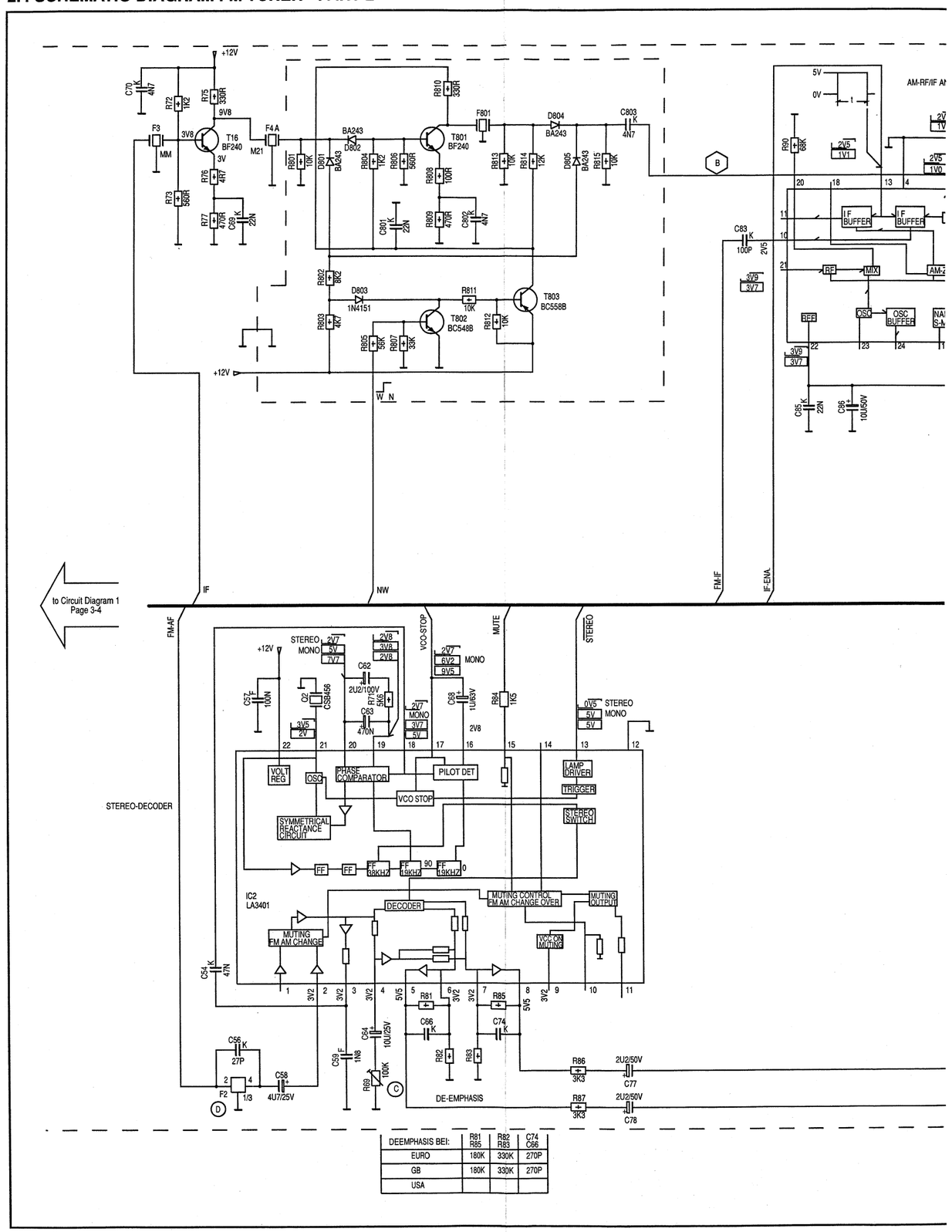
2.2 WIDE / NARROW PCB
(component side)



2.3 FM TUNER PCB
(component side)

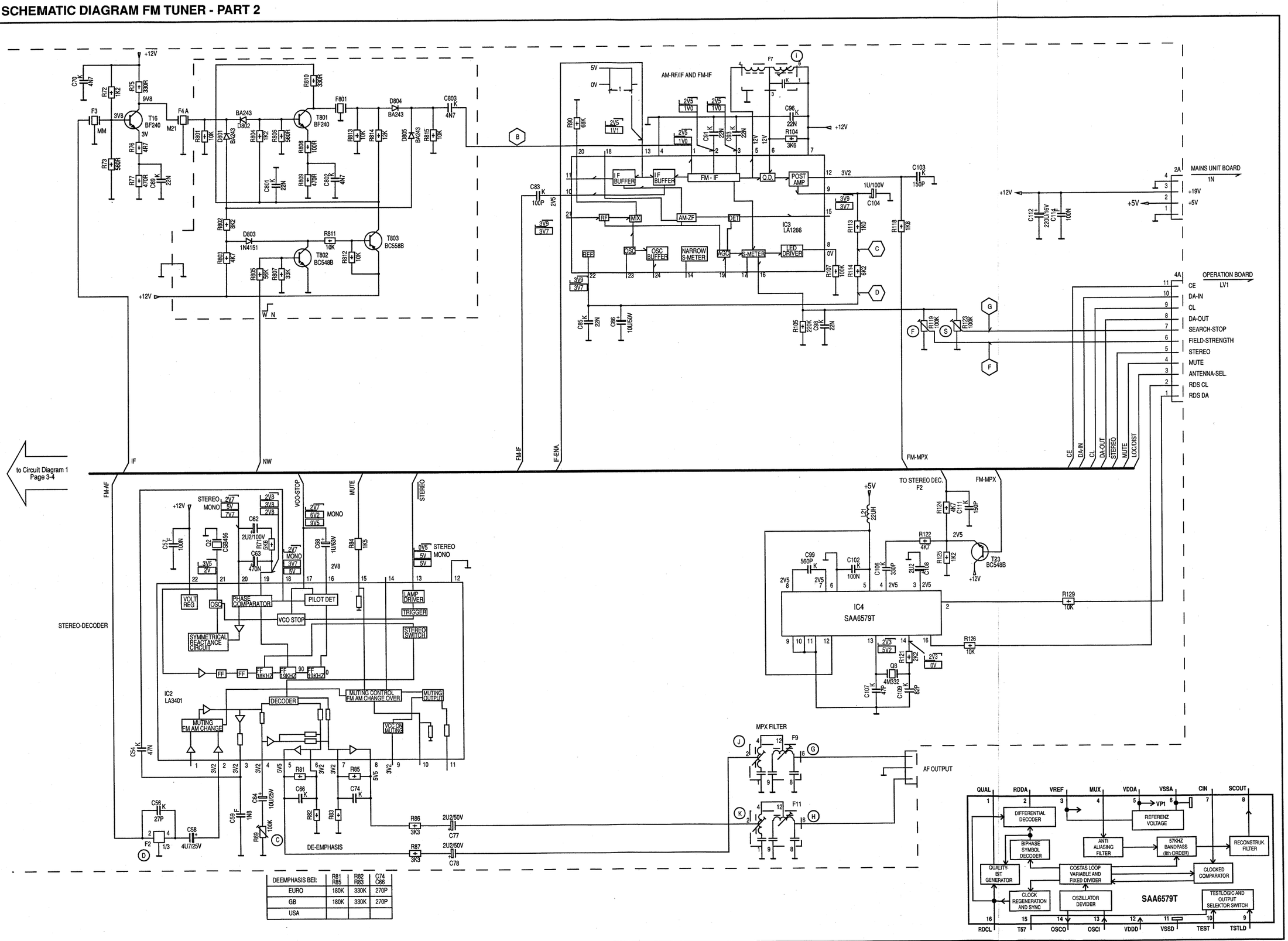


2.4 SCHEMATIC DIAGRAM FM TUNER - PART 2



DEEMPHASIS BEI:	R81 R85	R82 R83	C74 C66
EURO	180K	330K	270P
GB	180K	330K	270P
USA			

2.4 SCHEMATIC DIAGRAM FM TUNER - PART 2

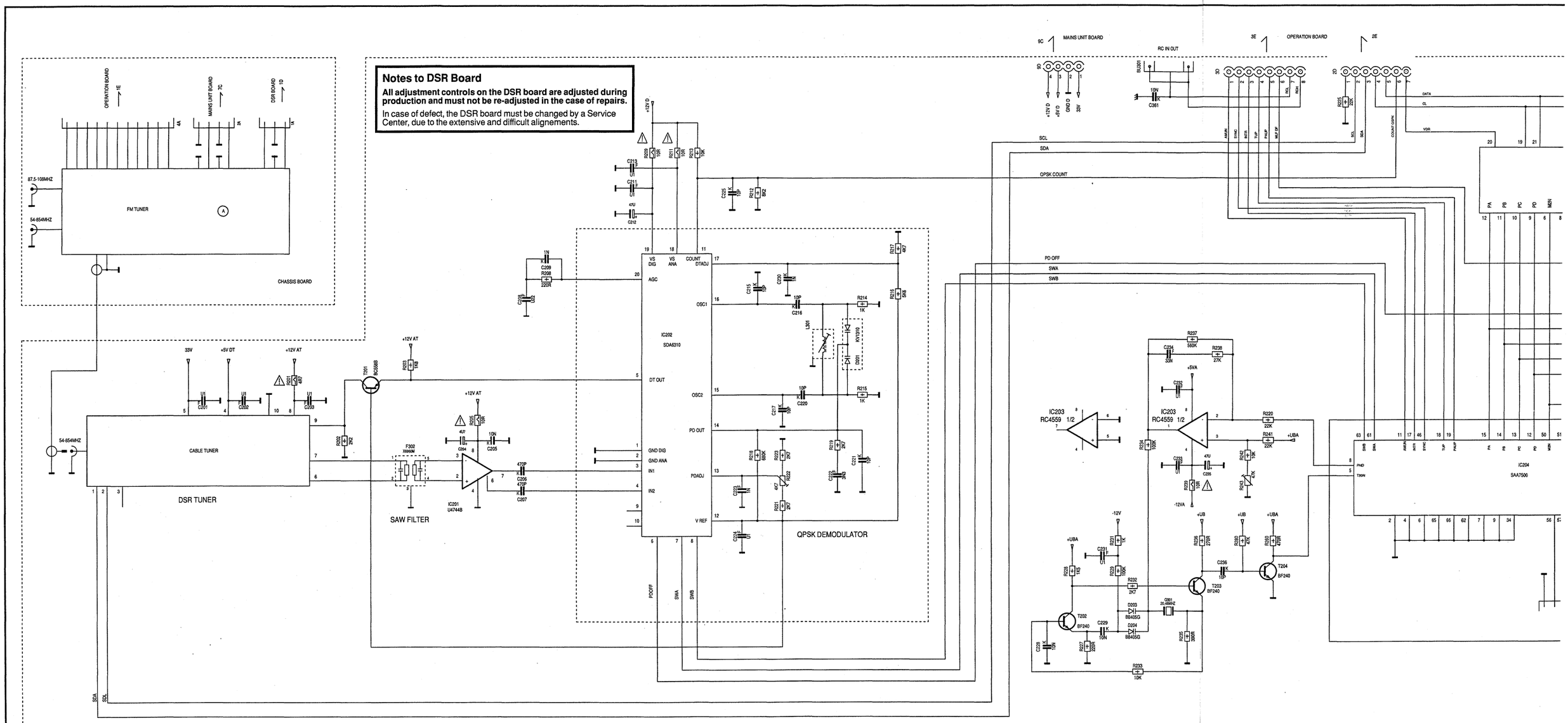


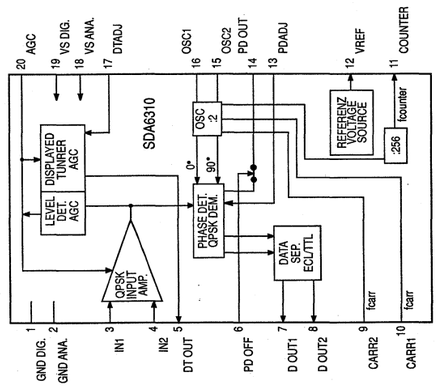
2.5 SCHEMATIC DIAGRAM DSR BOARD - PART 1

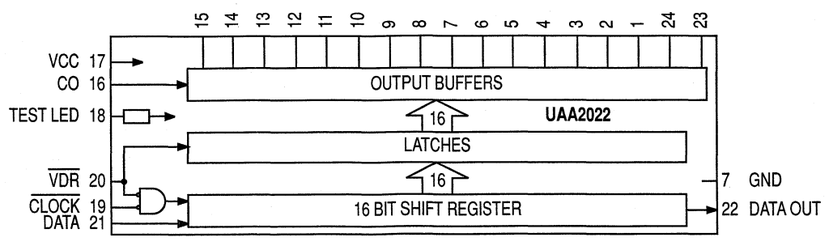
Notes to DSR Board

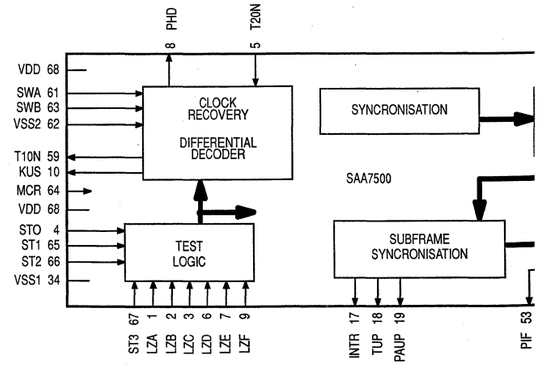
All adjustment controls on the DSR board are adjusted during production and must not be re-adjusted in the case of repairs.

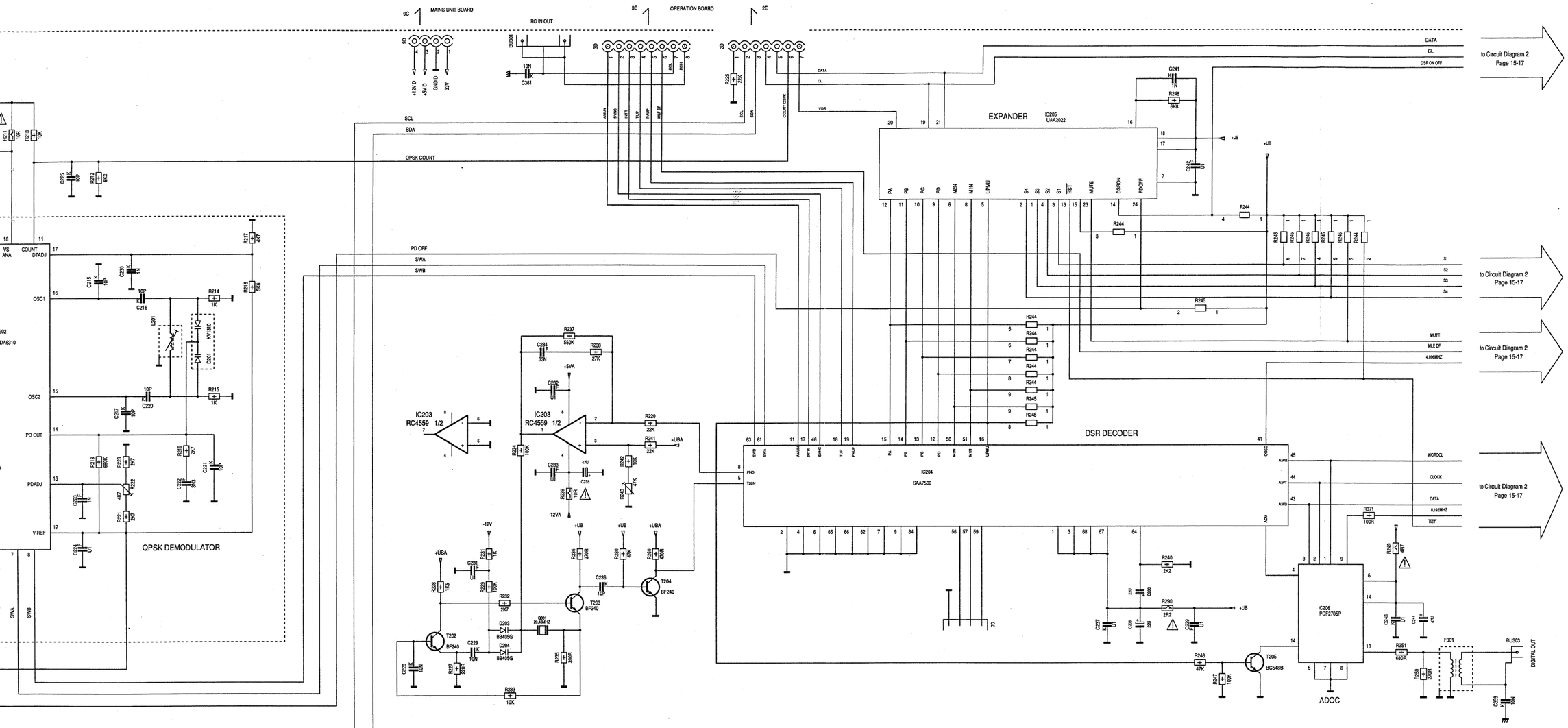
In case of defect, the DSR board must be changed by a Service Center, due to the extensive and difficult alignements.

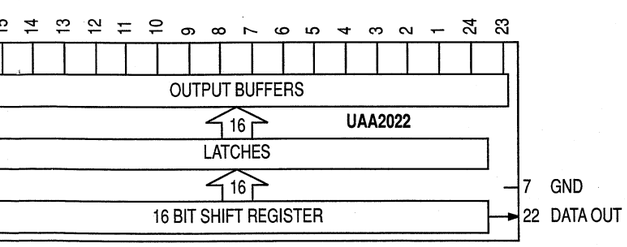


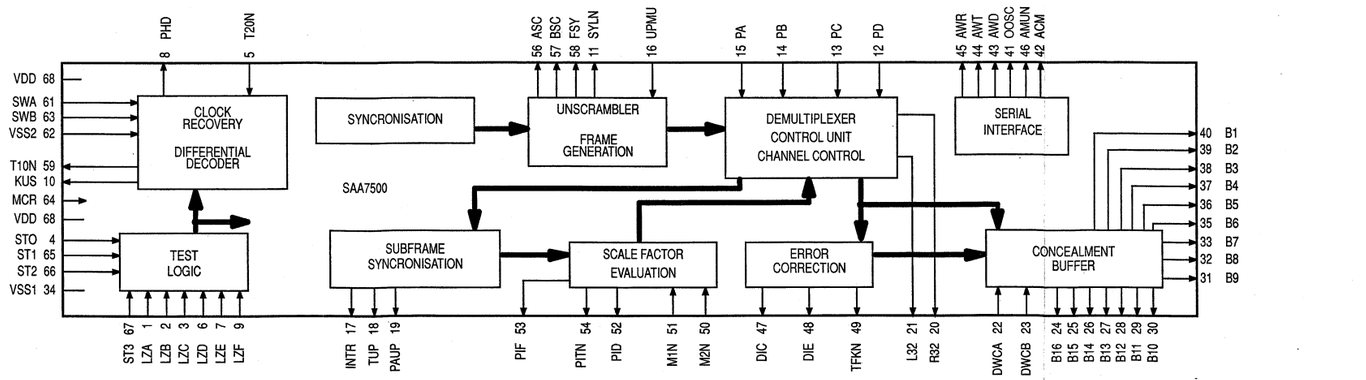




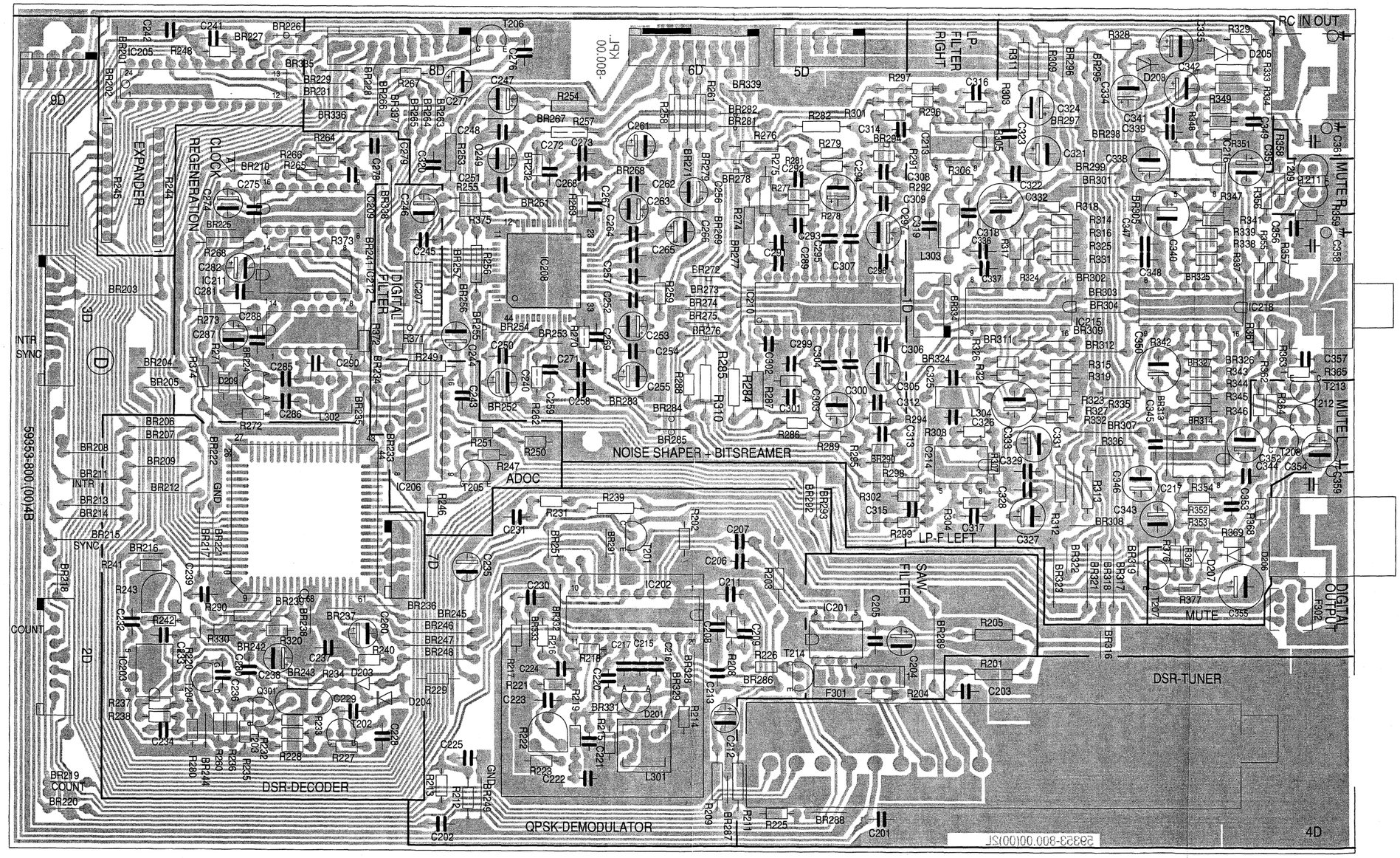



MAINS UNIT BOARD
OPERATION BOARD
RC IN OUT
EXPANDER
IC205 UAA2022
DSR DECODER
IC204 SAA7500
ADOC
IC206 PCF2705P
QPSK DEMODULATOR
IC203 RC4559 1/2
to Circuit Diagram 2 Page 15-17
DATA
CL
DSR ON OFF
SCL
SDA
OPSK COUNT
PD OFF
SWA
SWB
MUTE
MUTE DF
4.096MHZ
WORDCL
CLOCK
8.192MHZ
RESET
DIGITAL OUT

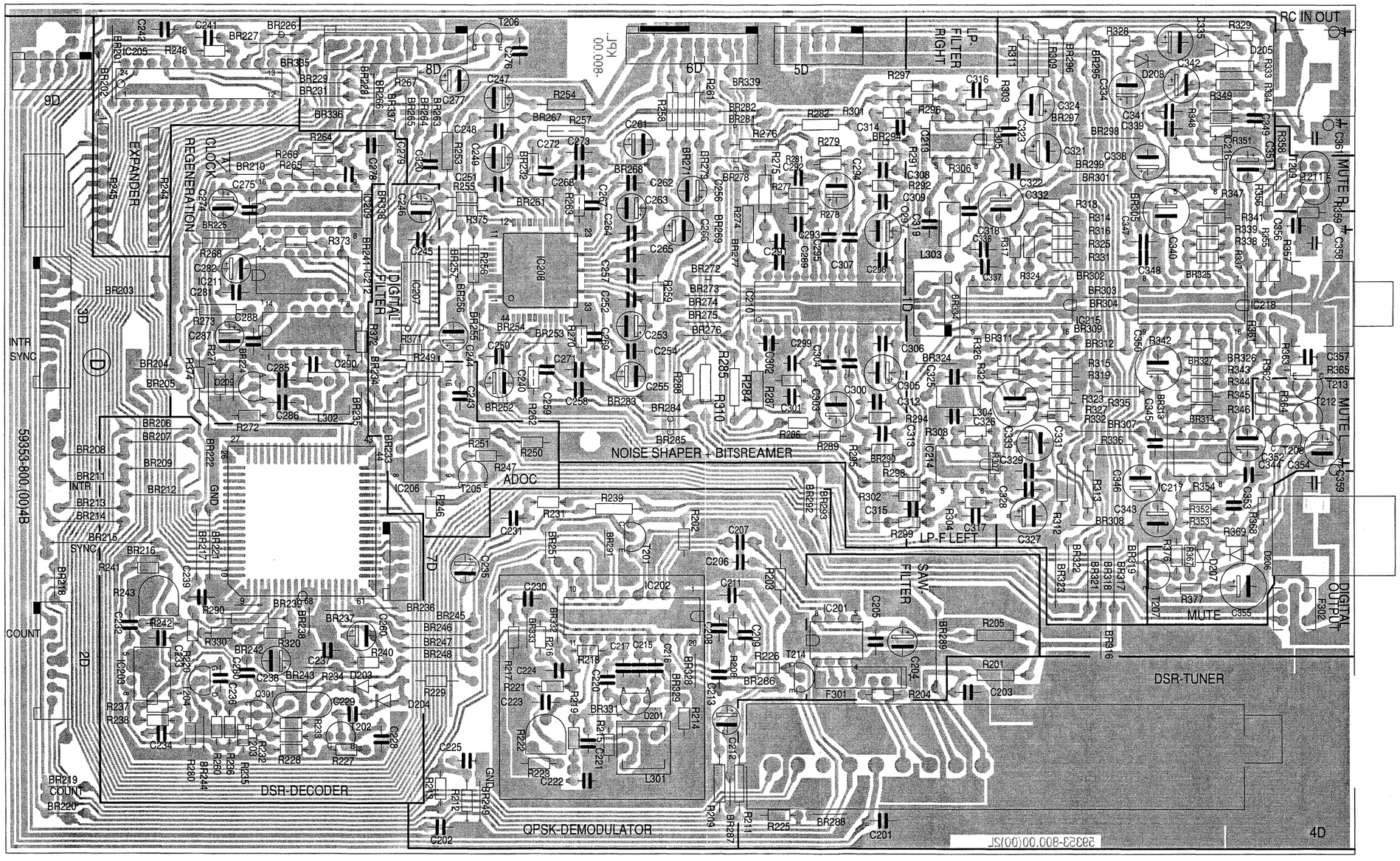

OUTPUT BUFFERS
16
UAA2022
LATCHES
16
16 BIT SHIFT REGISTER
7 GND
22 DATA OUT


CLOCK RECOVERY DIFFERENTIAL DECODER
SYNCRONISATION
UNSCRAMBLER FRAME GENERATION
DEMULTIPLEXER CONTROL UNIT CHANNEL CONTROL
SERIAL INTERFACE
TEST LOGIC
SUBFRAME SYNCRONISATION
SCALE FACTOR EVALUATION
ERROR CORRECTION
CONCEALMENT BUFFER
SAA7500

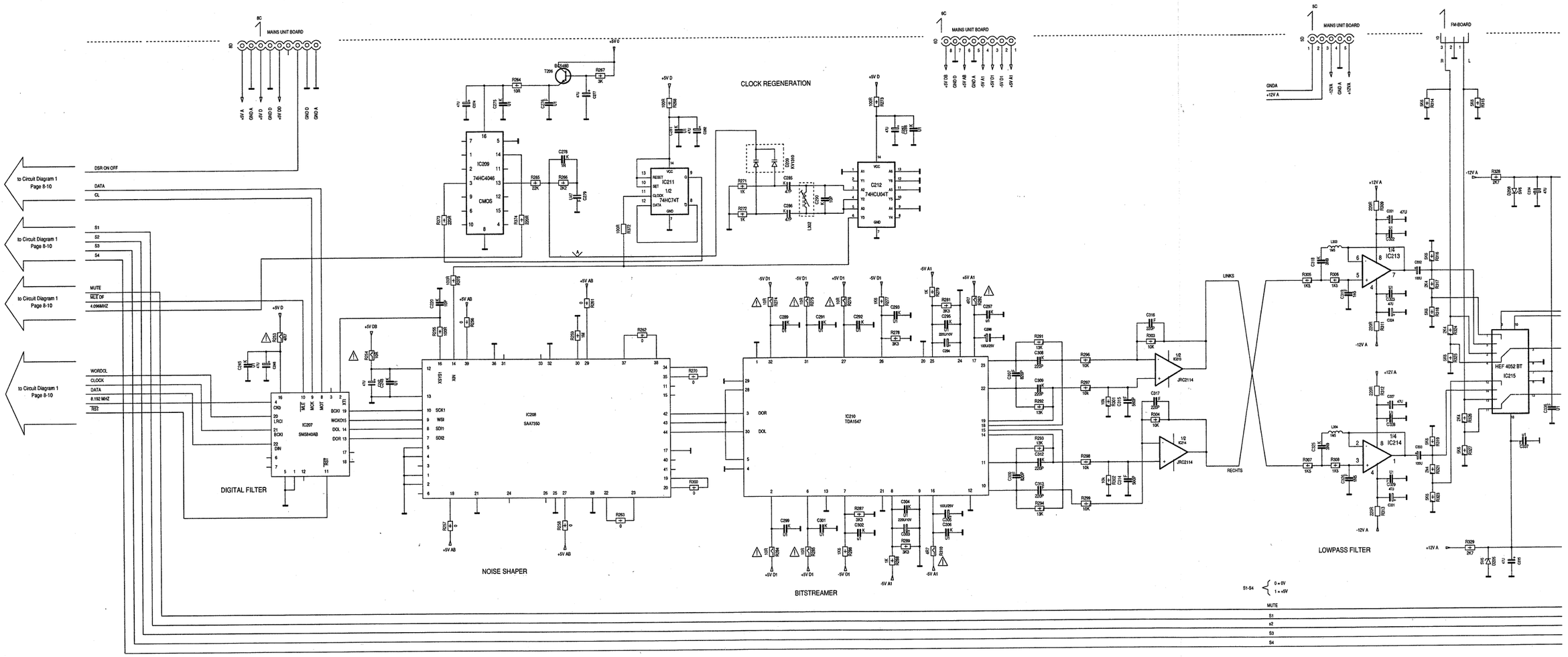
2.6 DSR PCB
(component side)

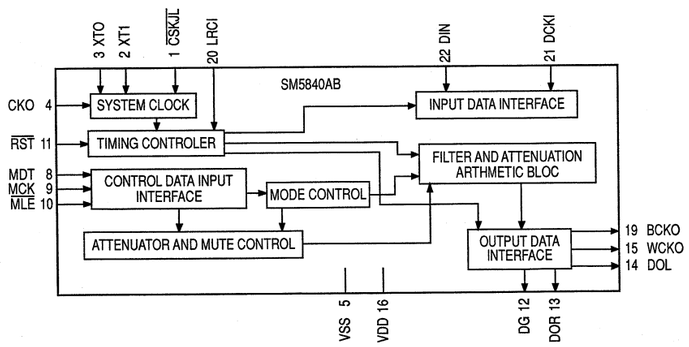


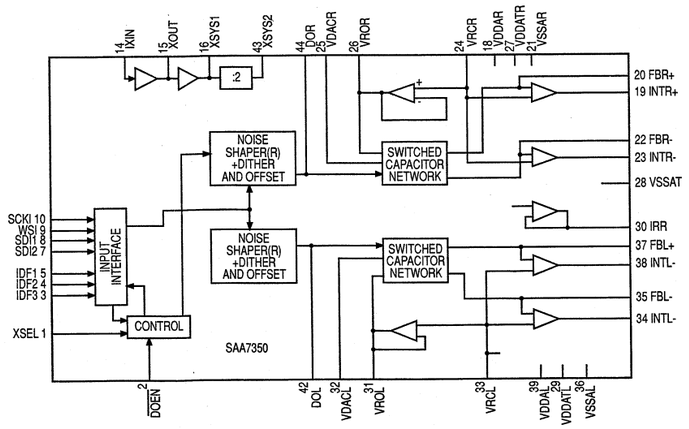
2.6 DSR PCB
(component side)

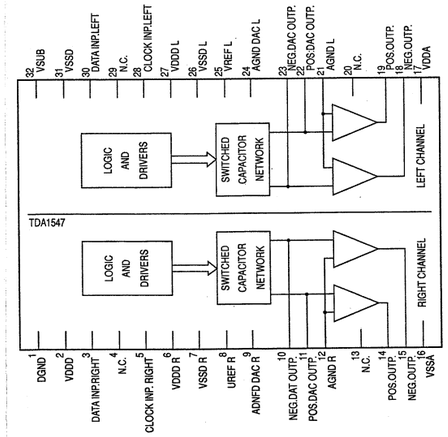


2.7 SCHEMATIC DIAGRAM DSR BOARD - PART 2









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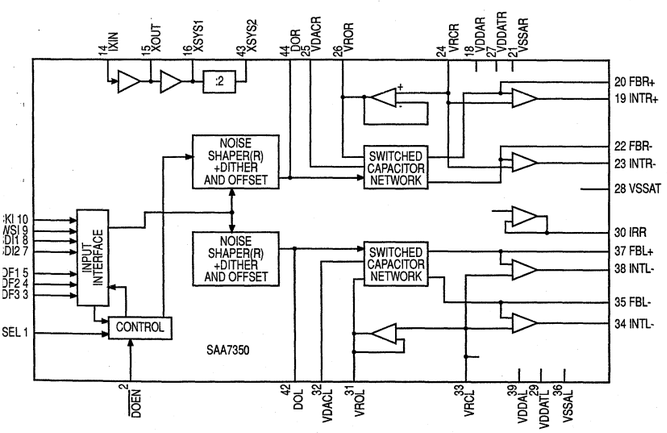
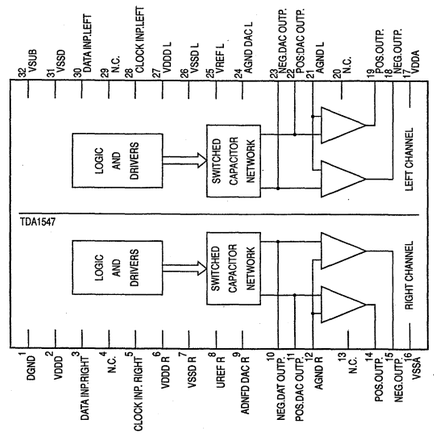


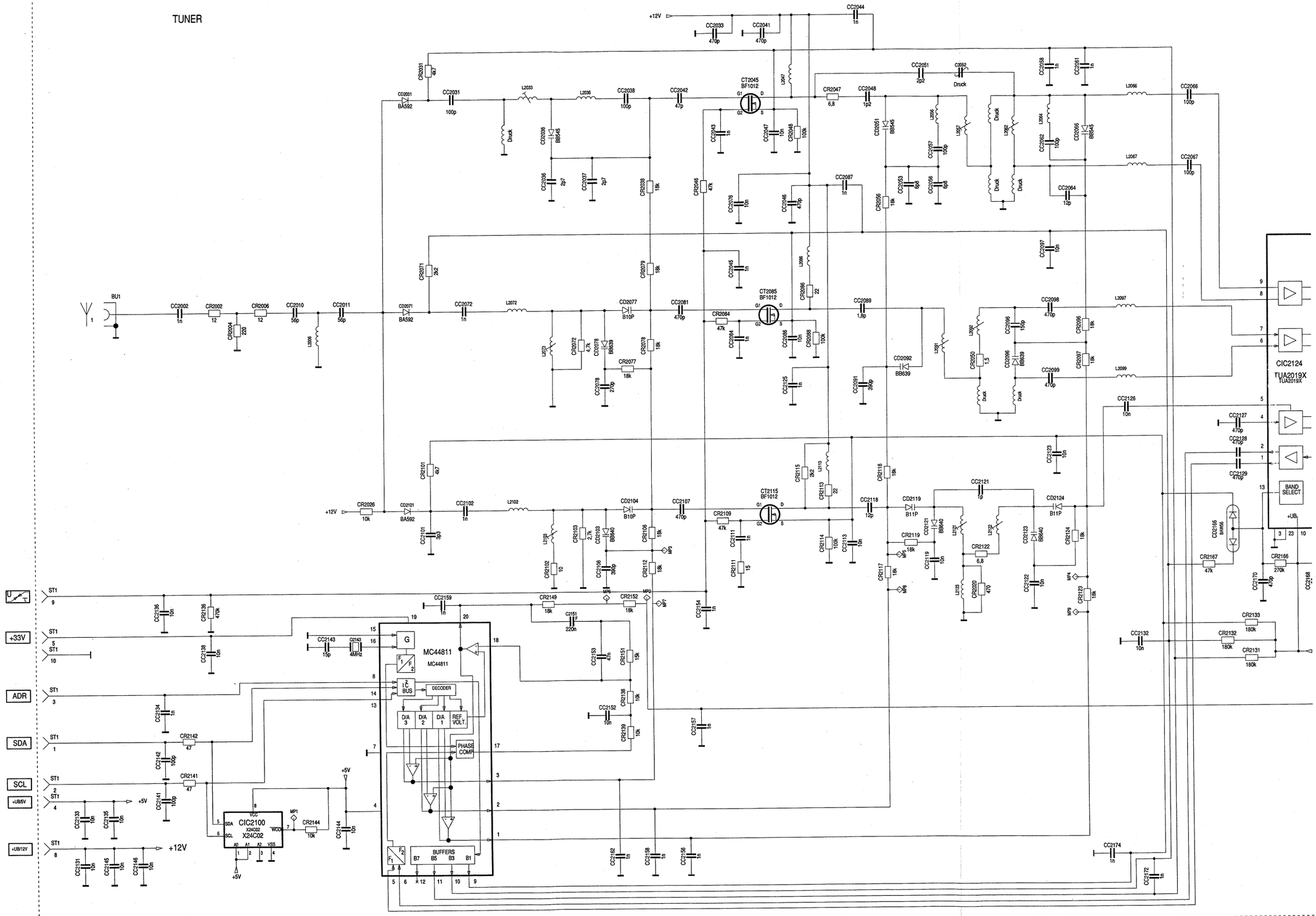


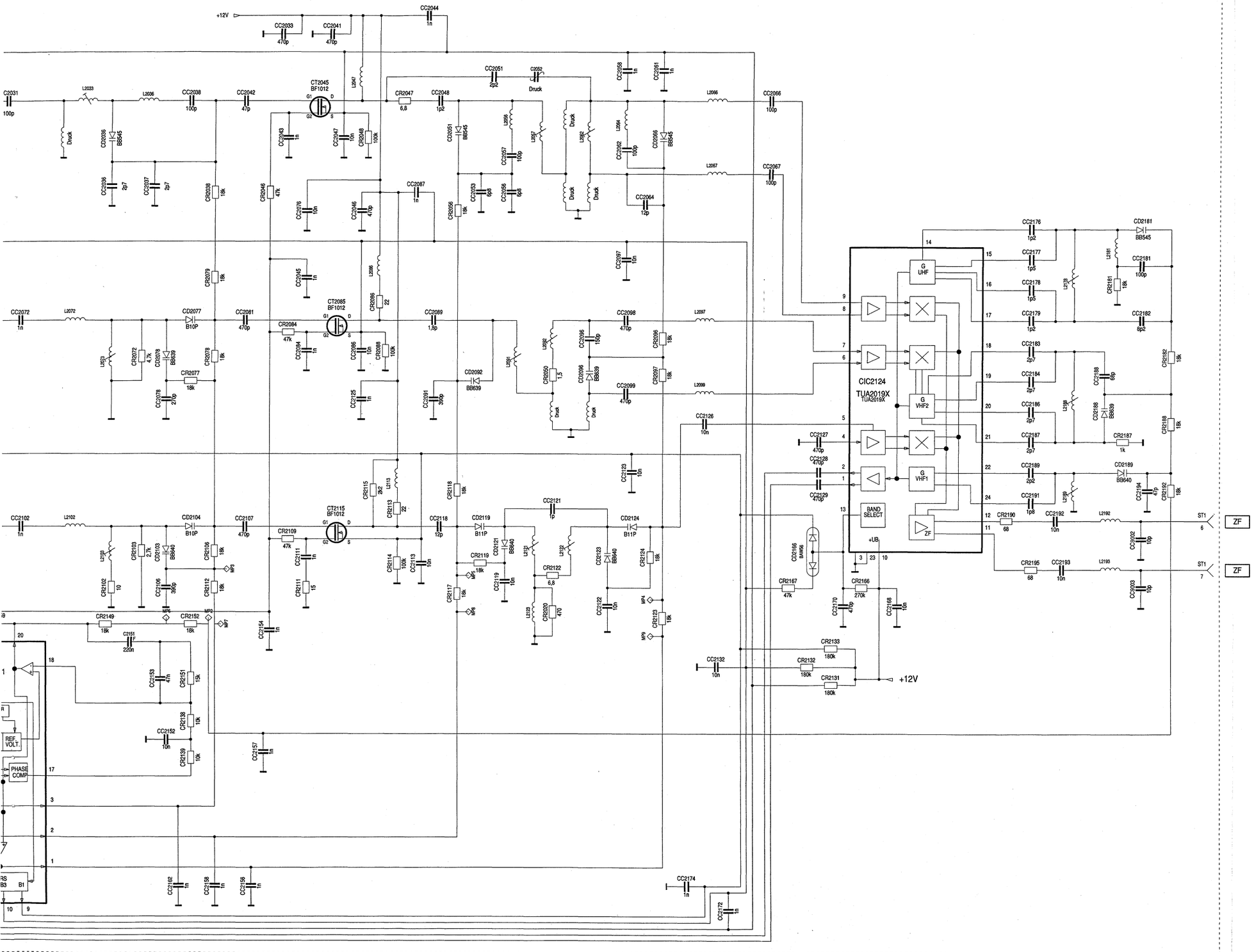
Abbreviation

SDA	Serial data line (I^2C Bus)
SCL	Serial clock line (I^2C Bus)
+5V DT	5V digital unit
+12V AT	12V analog unit
PDOFF	Phase detector (off input)
SWA	Base band signal A
SWB	Base band signal B
QPSK COUNT	Counter
AMUN	Mute signal
SYNC	Synchronisation
INTR	Interrupt
TUP	Programm type clock
PAUP	Programm type data
MLE	Mode set latch enable
RCL	RC5 - low
RCH	RC5 - high
S1.....S4	Set line (for music/speach, analog tuner, DSR tuner)
RST	Reset
VDR	Chip enable (UAA2022)

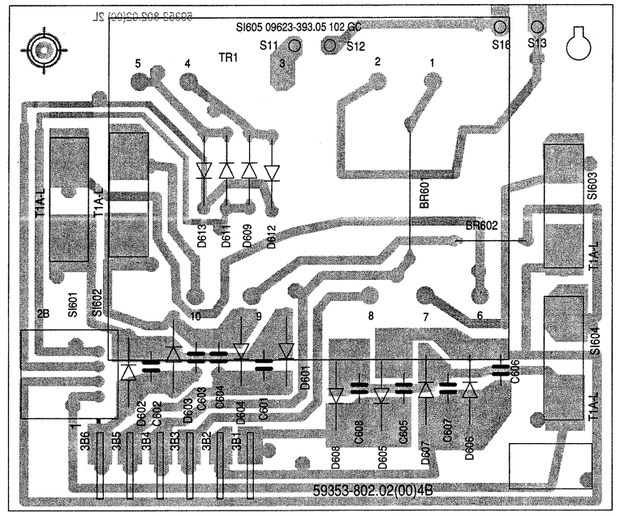
2.8 SCHEMATIC DIAGRAM CABLE TUNER

TUNER

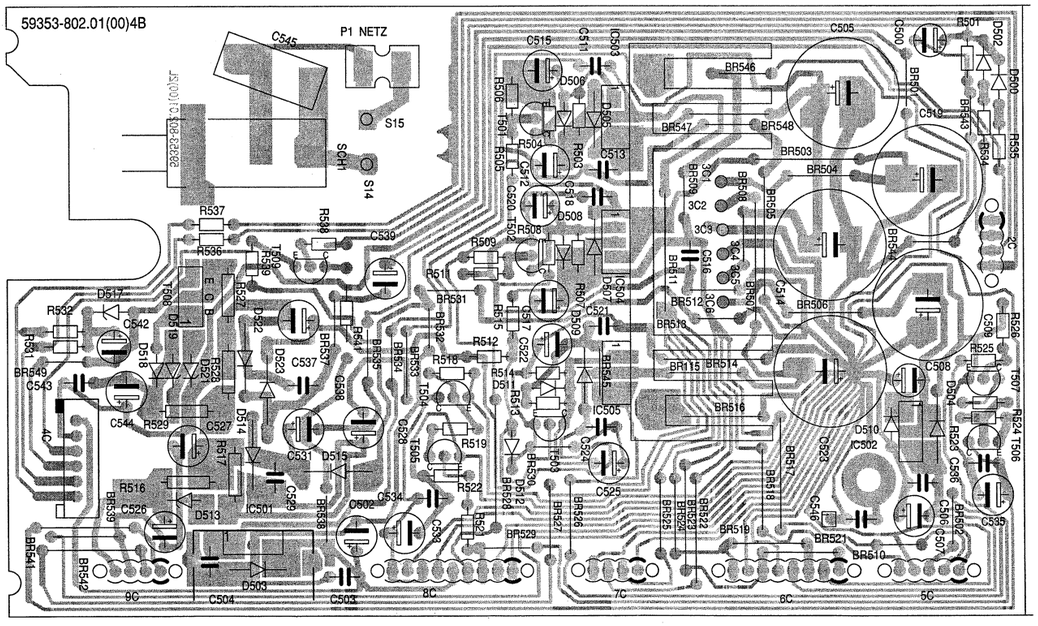



+12V
CC2044 1n
CC2033 470p
CC2041 470p
CC2051 2p2
C2052 Druck
CC2058 1n
CC2061 1n
C2031 100p
L2033
L2036
CC2038 100p
CC2042 47p
CT2045 BF1012
CR2047 6,8
CC2048 1p2
L2047
L2066
CC2066 100p
CD2036 BB545
CC2036 2p7
CC2037 2p7
CR2038 18k
CR2046 47k
CC2043 1n
CC2047 10n
CR2048 100k
CC2051 BB545
L2056
L2057
CC2057 100p
L2062
CC2062 100p
CD2066 BB545
L2067
CC2067 100p
CC2076 10n
CC2046 470p
CC2087 1n
CR2056 18k
CC2053 6p8
CC2056 6p8
CC2064 12p
CC2097 10n
CR2079 18k
CC2045 1n
L2096
CR2086 22
CT2085 BF1012
CC2072 1n
L2072
CD2077 B10P
CC2081 470p
CR2084 47k
CC2084 1n
CC2086 10n
CR2088 100k
CC2089 1,8p
CC2098 470p
L2097
CC2096 150p
CR2096 18k
CR2097 18k
CC2099 470p
L2099
L2071
CR2072 4,7k
CD2078 BB639
CR2078 18k
CR2077 18k
CC2078 270p
CC2125 1n
CC2091 39p
CD2092 BB639
L2091
L2092
CR2050 1,5
CD2096 BB639
CC2126 10n
CC2127 470p
CC2128 470p
CC2129 470p
CC2123 10n
CR2115 2k2
L2115
CR2113 22
CR2118 18k
CC2118 12p
CD2119 B11P
CC2121 1p
CD2124 B11P
CC2102 1n
L2102
CD2104 B10P
CC2107 470p
CR2109 47k
CT2115 BF1012
CR2119 18k
CD2121 BB640
CR2122 6,8
CD2123 BB640
CR2124 18k
L2071
CR2102 10
CR2103 2,7k
CD2103 BB640
CC2106 390p
CR2106 18k
CR2112 18k
CC2111 1n
CR2111 15
CR2114 100k
CC2113 10n
CR2117 18k
L2121
L2122
CR2120 470
CC2119 10n
L2123
CR2123 18k
CC2122 10n
CC2154 1n
CR2149 18k
CR2152 18k
C2151 220n
CC2153 47n
CR2151 15k
CR2138 10k
CC2152 10n
CR2139 10k
CC2157 1n
REF. VOLT.
PHASE COMP
CC2162 1n
CC2158 1n
CC2155 1n
CC2174 1n
CC2172 1n
CIC2124
TUA2019X
TUA2019X
G UHF
G VHF2
G VHF1
BAND SELECT
ZF
+UB
CD2166 BAW56
CR2167 47k
CR2166 270k
CC2170 470p
CC2168 10n
CC2176 1p2
CD2181 BB545
CC2177 1p5
L2181
CC2181 100p
CC2178 1p5
L2178
CR2181 18k
CC2179 1p2
CC2182 8p2
CR2182 18k
CC2183 2p7
CC2184 2p7
CC2188 68p
CC2186 2p7
L2188
CD2188 BB639
CC2187 2p7
CR2187 1k
CR2188 18k
CC2189 2p2
CD2189 BB640
CC2194 470
CR2192 18k
CC2191 1p8
L2189
CR2190 68
CC2192 10n
L2192
CC2202 10p
ST1 6
ZF
CR2195 68
CC2193 10n
L2193
CC2203 10p
ST1 7
ZF
CR2133 180k
CC2132 10n
CR2132 180k
CR2131 180k
+12V

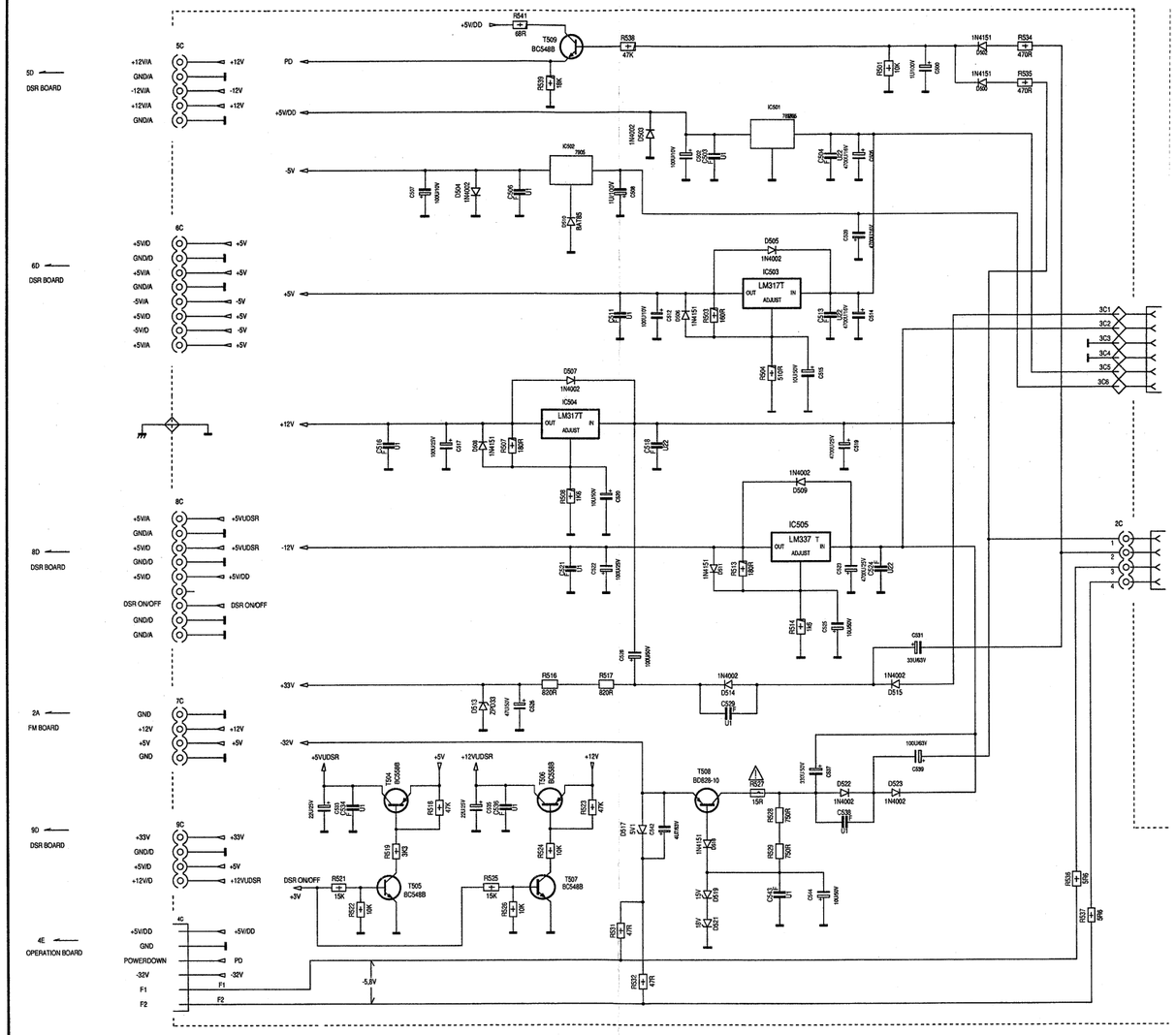
2.9 TRANSFORMER PCB
(component side)



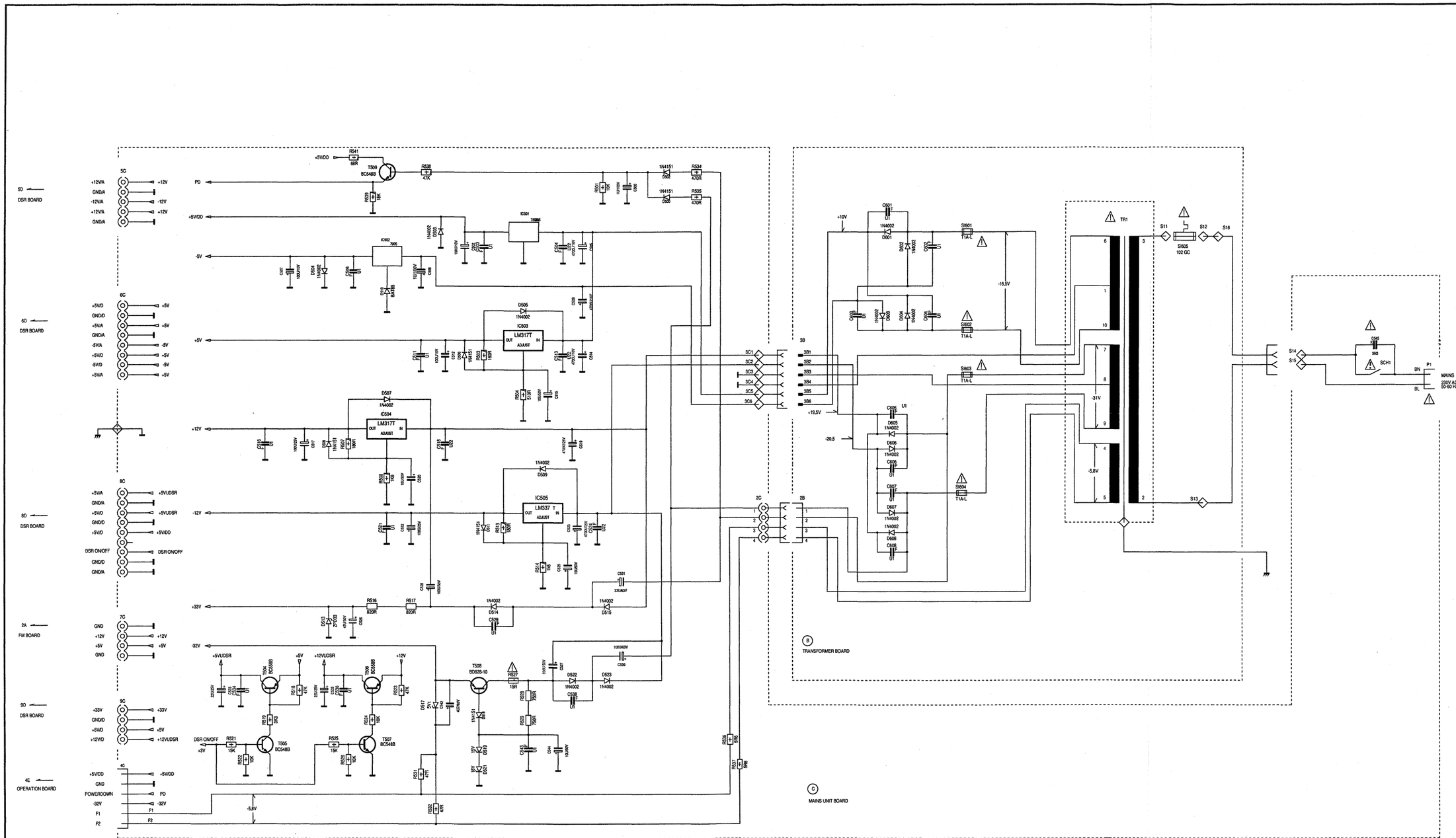
2.10 MAINS UNIT PCB
(component side)



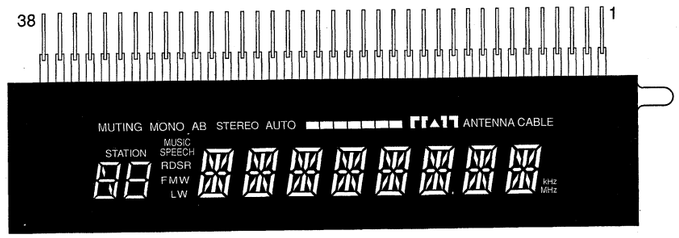
2.11 SCHEMATIC DIAGRAM MAINS UNIT- AND TRANSFORMER BOARD



2.11 SCHEMATIC DIAGRAM MAINS UNIT- AND TRANSFORMER BOARD



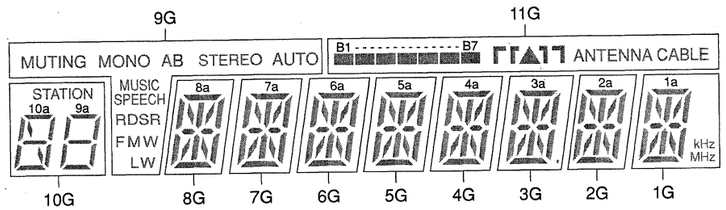
2.12 DISPLAY

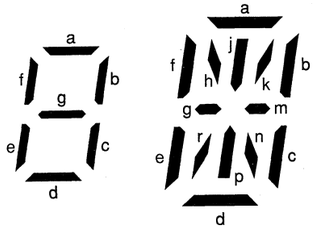


PIN CONNECTION

PIN NO.	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	F 2	F 2	N P	N P	P 1 6	P 1 5	P 1 4	P 1 3	P 1 2	P 1 1	P 1 0	P 9	P 8	P 7	P 6	P 5	P 4	P 3	P 2	P 1	N C	N C	N C	11 G	10 G	9 G	8 G	7 G	6 G	5 G	4 G	3 G	2 G	1 G	N P	N P	F 1	F 1

F1, F2 --- Filament NP --- No pin NC --- No connection 1G~11G --- Grid

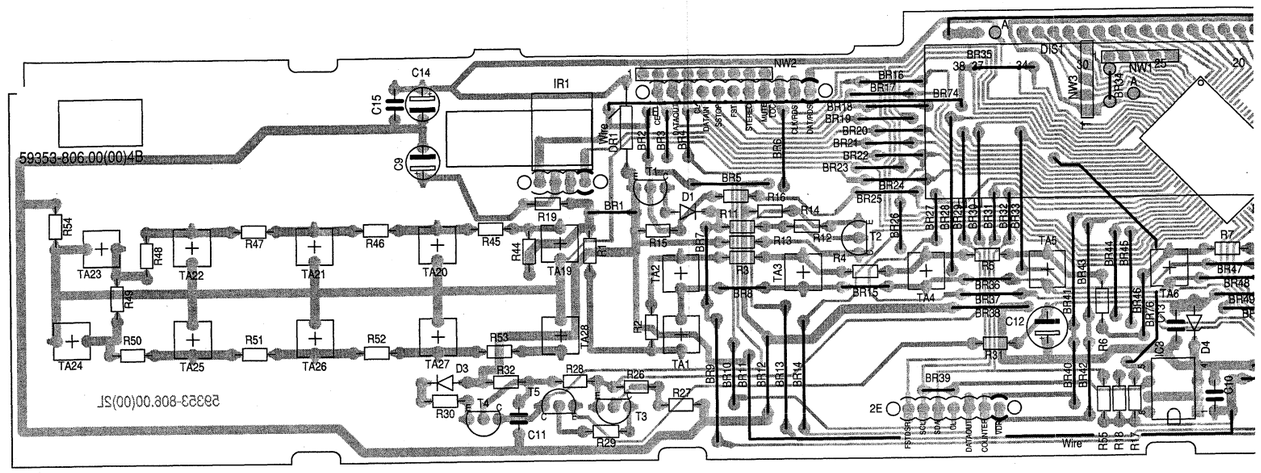




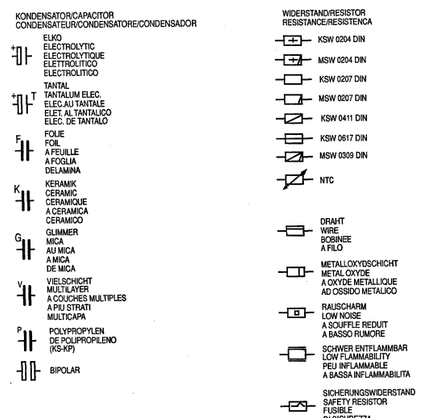
ANODE CONNECTION

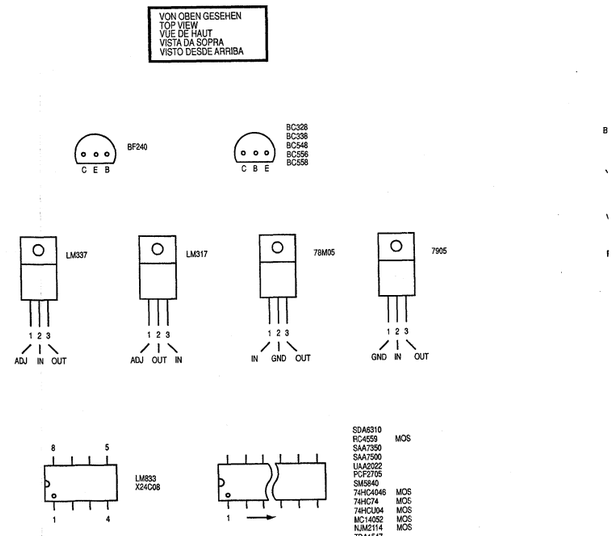
	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	CABLE	9a	MUSIC	8a	7a	6a	5a	4a	3a	2a	1a
P2	ANTENNA	9b	SPEECH	8b	7b	6b	5b	4b	3b	2b	1b
P3	(Right)	9f	F	8f	7f	6f	5f	4f	3f	2f	1f
P4	(Left)	9g	M	8k	7k	6k	5k	4k	3k	2k	1k
P5	▲	9c	W	8j	7j	6j	5j	4j	3j	2j	1j
P6	(Right)	9e	LW	8h	7h	6h	5h	4h	3h	2h	1h
P7	(Left)	9d	R (Left)	8m	7m	6m	5m	4m	3m	2m	1m
P8	B7	10a	DS	8g	7g	6g	5g	4g	3g	2g	1g
P9	B6	10b	R (Right)	8n	7n	6n	5n	4n	3n	2n	1n
P10	B5	10f	-	8p	7p	6p	5p	4p	3p	2p	1p
P11	B4	10g	MUTING	8r	7r	6r	5r	4r	3r	2r	1r
P12	B3	10c	MONO	8c	7c	6c	5c	4c	3c	2c	1c
P13	B2	10e	STEREO	8e	7e	6e	5e	4e	3e	2e	1e
P14	B1	10d	AUTO	8d	7d	6d	5d	4d	3d	2d	1d
P15	-	STATION	A	-	-	-	-	-	-	-	kHz
P16	-		B	-	-	-	-	-	-	-	MHz

2.13 OPERATION PCB
(component side)

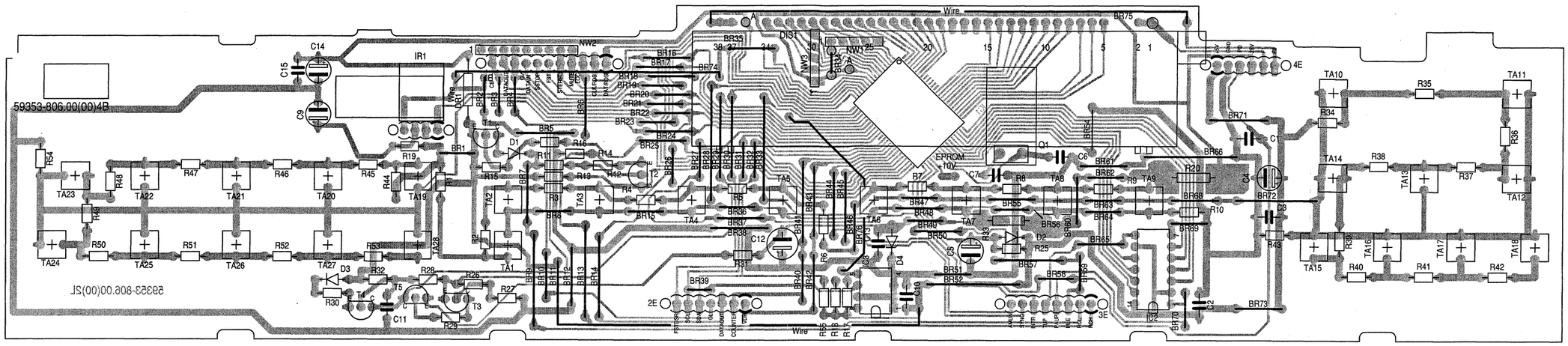


2.14 NOTE OF COMPONENTS





2.13 OPERATION PCB
(component side)



2.14 NOTE OF COMPONENTS

KONDENSATOR/CAPACITOR
CONDENSATEUR/CONDENSATORE/CONDENSADOR

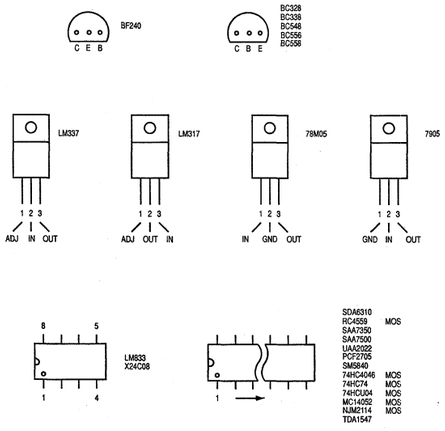
- ELKO
  ELECTROLYTIC
  ELECTROLYTIQUE
  ELETTROLITICO
  ELECTROLITICO
- TANTAL
  TANTALUM ELEC.
  ELEC.AU TANTALE
  ELET.AL TANTALICO
  ELEC. DE TANTALO
- FOLIE
  FOIL
  A FEUILLE
  A FOGLIA
  DELAMINA
- KERAMIK
  CERAMIC
  CERAMIQUE
  A CERAMICA
  CERAMICO
- GLIMMER
  MICA
  AU MICA
  A MICA
  DE MICA
- VIELSCHICHT
  MULTILAYER
  A COUCHES MULTIPLES
  A PIU STRATI
  MULTICAPA
- POLYPROPYLEN
  DE POLIPROPILENO
  (KS-KP)
- BIPOLAR

WIDERSTAND/RESISTOR
RESISTANCE/RESISTENCIA

- KSW 0204 DIN
- MSW 0204 DIN
- KSW 0207 DIN
- MSW 0207 DIN
- KSW 0411 DIN
- KSW 0617 DIN
- MSW 0309 DIN
- NTC

- DRAHT
  WIRE
  BOBINEE
  A FILO
- METALLOXYDSCHICHT
  METAL OXYDE
  A OXYDE METALLIQUE
  AD OSSIDO METALICO
- RAUSCHARM
  LOW NOISE
  A SOUFFLE REDUIT
  A BASSO RUMORE
- SCHWER ENTFLAMMBAR
  LOW FLAMMABILITY
  PEU INFLAMMABLE
  A BASSA INFLAMMABILITA
- SICHERUNGSWIDERSTAND
  SAFETY RESISTOR
  FUSIBLE
  DI SICUREZZA

VON OBEN GESEHEN
TOP VIEW
VUE DE HAUT
VISTA DA SOPRA
VISTO DESDE ARRIBA



BK=SCHWARZ
BLACK
NERO
NOIR
NEGRO
YE=GELB
YELLOW
JAUNE
GIALLO
AMARILLO
VT=VIOLETT
VIOLET
VIOLETTO
VIOLETA
RS=ROSA
PINK
ROSE

BN=BRAUN
BROWN
BRUN
MARRONE
MARRON
GN=GRUEN
GREEN
VERT
VERDE
GY=GRAU
GREY
GRIS
GRIGIO
OR=ORANGE
ARANCIONE
NARANJA

RD=ROT
RED
ROUGE
ROSSO
ROJO
BU=BLAU
BLUE
BLEU
BLU
AZUL
WH=WEISS
WHITE
BLANC
BIANCO
BLANCO
NF=NATURFARBEN
NATURAL COLOR
COLEUR NATURELLE
COLORI NATURALRE
COLOR NATURAL

ACHTUNG !
VORSCHRIFTEN BEIM UMGANG MIT
MOS BAUTEILEN BEACHTEN.
ATTENTION !
OBSERVE MOS COMPONENTS HANDLING
INSTRUCTIONS WHEN SERVICING.
ATTENTION !
LORS LA MANIPULATION DES
CIRCUITS MOS,RESPECTER LES
PESCRIPTUIONS MOS.
ATTENZIONE !
OSSERVARE LE RELATIVE
PRESCRIZIONI DURANTE LAVORI CON
COMPONENTI MOS.
ATENCION !
RESPETAR EL TRATIAMENTO DE
COMPONENTS MOS.

SPANNUNGEN MIT VOLTMETER (Ri=10 MOHM), FALLS NICHT
ANDERS ANGEGEBEN, GEGEN MASSE GEMESSEN.
MESSWERTE GELTEN BEI 220V~ NETZSPANNUNG.

IF NOT OTHERWISE INDICATED ALL VOLTAGES ARE MEASURED
AGAINST CHASSIS WITH A VOLTMETER(Ri=10 MOHM).
THE VALUES ARE VALID FOR 220V AC MAINS VOLTAGES.

SAUF INDICATION CONTAIRE: LES TENSIONS SONT MESUREES
PAR RAPPORT AU CHASSIS AVEC UN VOLTMETRE (Ri=10 MOHM)
LES VALEURS SONT VALABLES POUR UNE TENSION SECTEUR
DE 220V CA.

TENSIONI MISURATE CON VOLTMETRO (Ri=10 MOHM), SALVE
ALTRE INDICATIONI, RIFERITE A MASSA I VALORI DI MISURA
VALGONO CON TENSIONE DI RETE DI 220V.

LAS TENSIONES, SIEMPRE QUE NO SE INDIQUE OTRA COSA,
SE MIDEN CON RESPECTO A MASA CON VOLTIMETRO (Ri=10 MOHM)
LOS VALORES DE MEDIDA SON VALIDOS CON 220V DE TENSION DE RED.

NF-SPANNUNGEN BEI 2 x 8W AN 8 OHM = 8V ~ AM AUSGANG,
1KHZ, LAUTSTAERKE VOLL AUF, DEFEAT EIN, BALANCE MITTE,
LAUTSPRECHERRELAIS EIN.

AF VOLTAGES AT 2 x 8W INTO 8 OHM = 8V ~ AT OUTPUT, 1KHZ,
VOLUME FULLY UP, DEFEAT ON, BALANCE IN CENTRE SETTING,
LOUDSPEAKER SWITCHES ON.

TENSIONS BF POUR 2 x 8W SUR 8 OHM = 8V~ A LA SORTIE, 1KHZ.
VOLUME AU MAXIMUM, DEFEAT EN SERVICE, REGLAGES DE BALANCE
EN POSITION MEDIANE, COMMUTATEUR HAUT-PARLEURS EN SERVICE.

TENSIONI BF ALL'USCITA CON 2 x 8W E 8 OHM = 8V ~, 1KHZ,
VOLUME AL MASSIMO, DEFEAT INSERITO, REGOLATORI DI BILANCIAMENTO
AL CENTRO, COMMUTATORI DEGLI ALTOPARLANTI INSERITI.

FUER DIE GERAETESICHERHEIT ABSOLUT ERFORDERLICH UND ENTSPRECHEND
DEN RICHTLINIEN DES VDE 820. IEC.IM ERSATZFALL DUERFEN NUR
BAUTEILE MIT GLEICHER SPEZIFIKATION VERWENDET WERDEN.

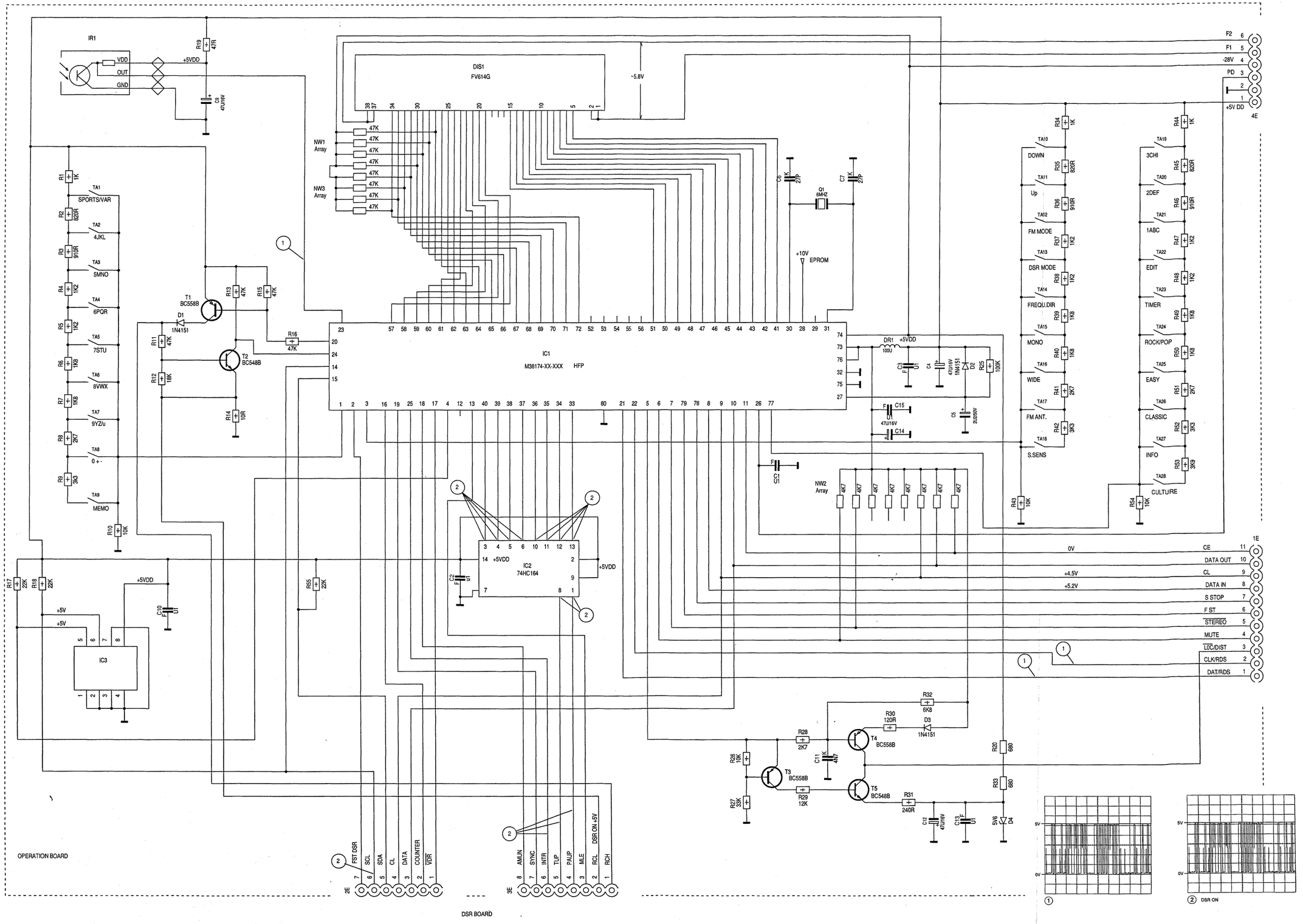
ABSOLUTELY NECESSAIRY FOR THE SAFETY OF THE SET.THESE COMPONENTS
MEET THE SAFETY REQUIREMENT ACCORDING TO VDE OR IEC.
MUST BE REPLACED BY PARTS OF SAME SPECIFICATION ONLY.

ABSOLUMENT NECESSAIRE POUR LA SECURITE DE L'APPAREIL
ET CONFORME AUX REGULATIONS VDE ET IEC.EN CAS DE REPLACEMENT
N'UTILISER QUE DE COMPOSANTS AVEC LES MEMES SPECIFICATION.

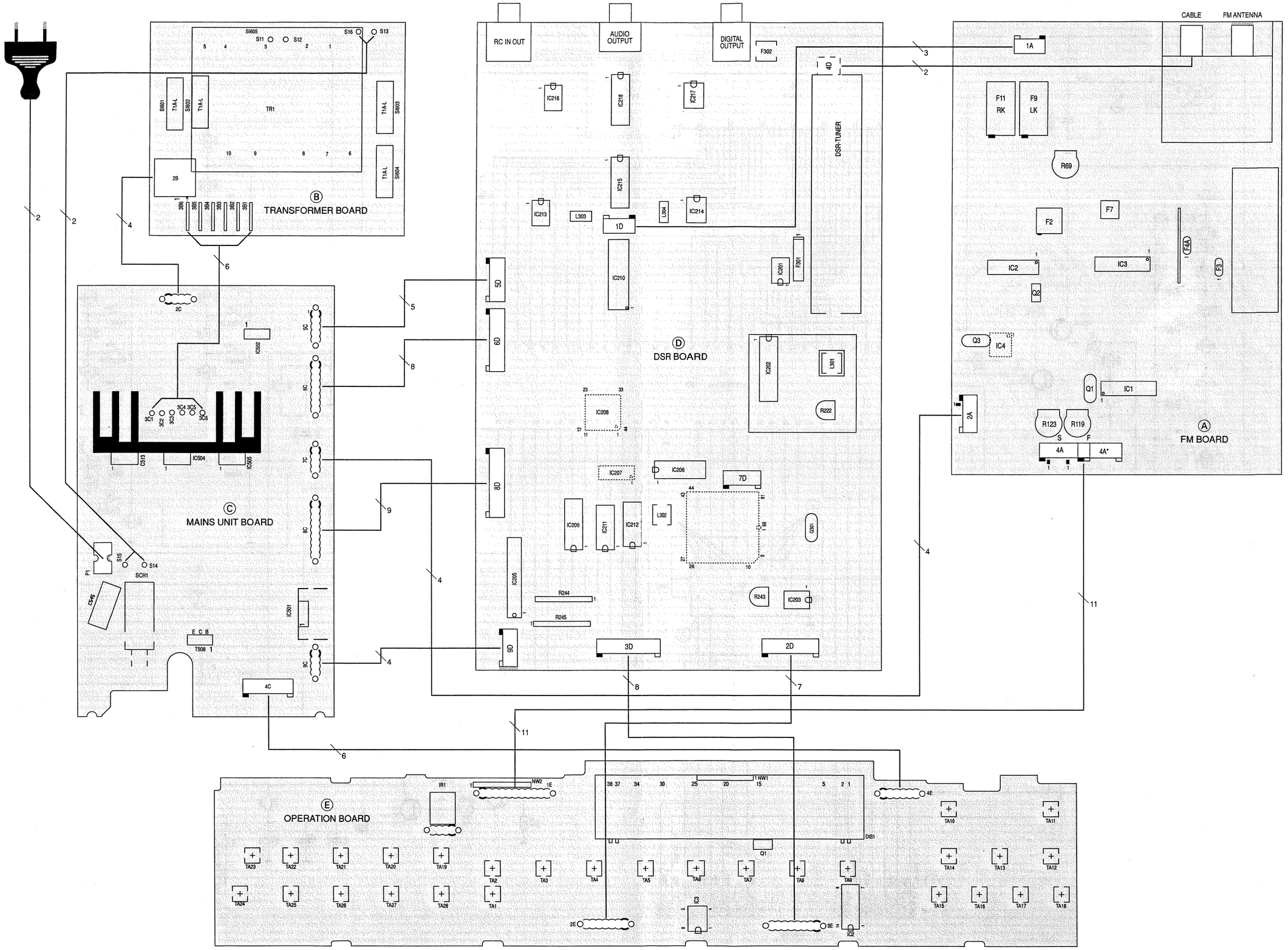
NECESSARI PER LA SICUREZZA DELL'APPARECHIO E SONO CONFORMI
ALLE NORMI DI SICUREZZA VDE E IEC.IN CASA DI SOSTITUZIONE
IMPIEGARE QUINDI SOLTANO PEZZI IN RICAMBO ORIGINALI.

ABSOLUTAMENTE NECESARIO PARA LA SEGURIDA DEL APARATO Y DE ACUERDO
CON LAS NORMAS DE SEGURIDAD VDE O IEC.EN CASO DE SUSTITUCION
SOLO DEBEN EMPLEARSE COMPONENTS CON LA MISMA ESPECIFICACION.

2.15 SCHEMATIC DIAGRAM OPERATION BOARD

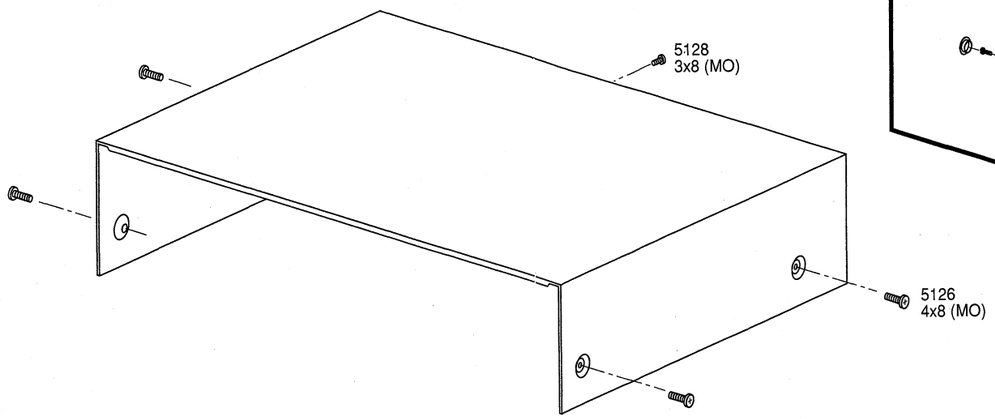


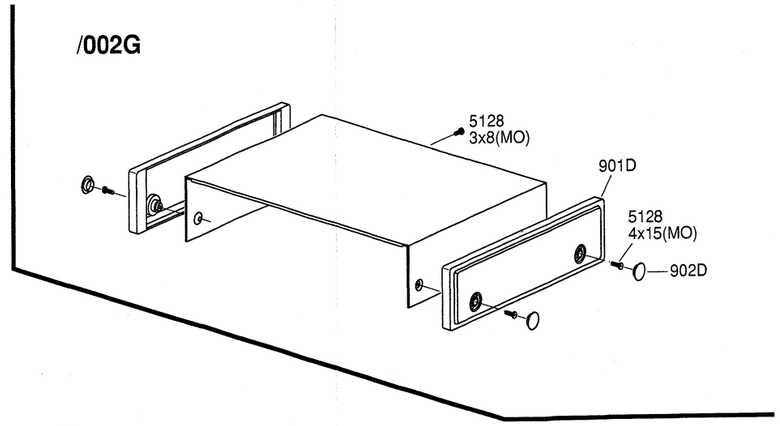
3. WIRING DIAGRAM

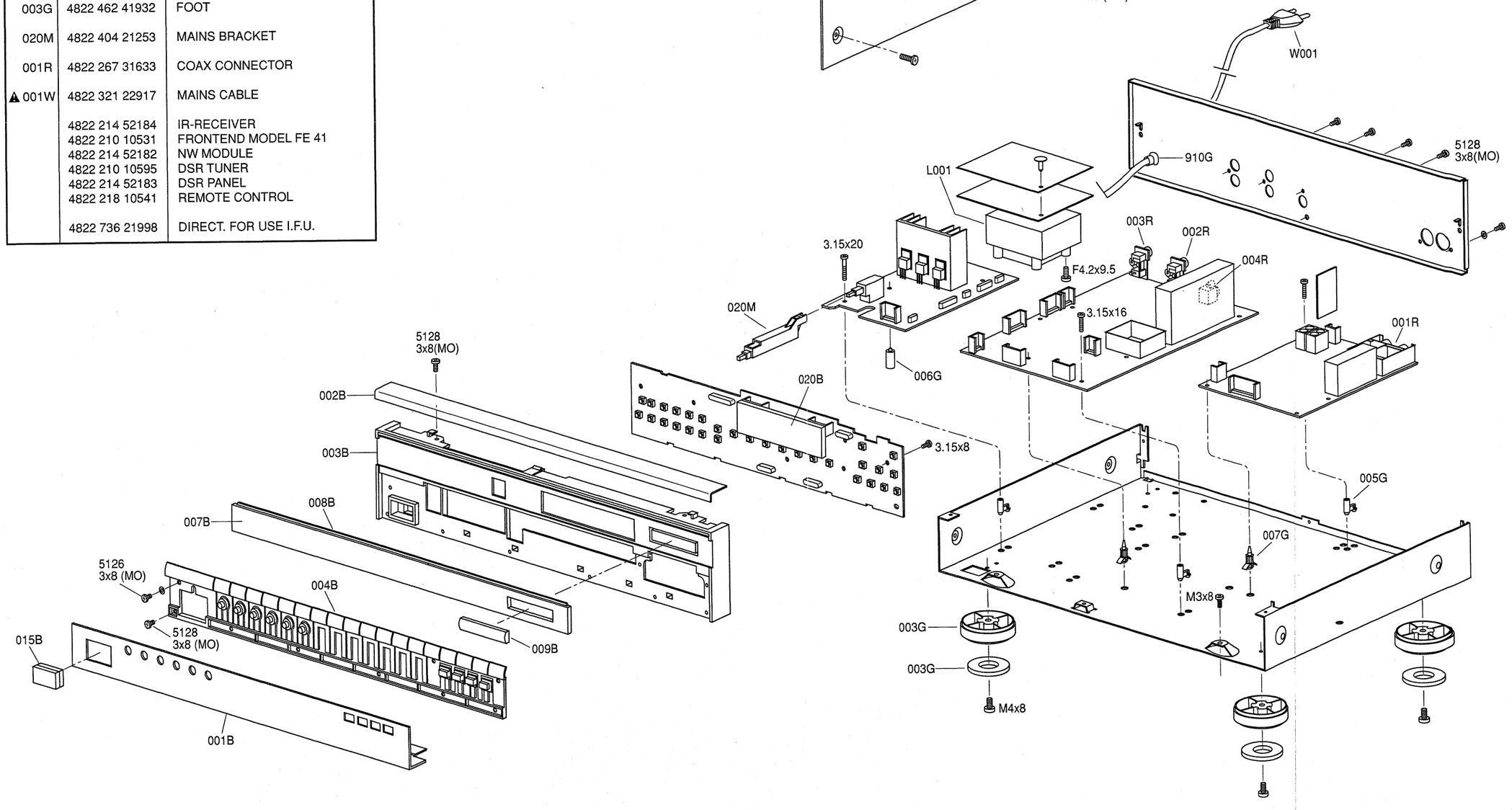


4. EXPLODED VIEW AND PARTS LIST

REF. DESIG.	PART NO.	DESCRIPTION
001B	4822 426 51731	FRONTCOVER (LOWER) BLACK
001B	4822 426 51729	FRONTCOVER (LOWER) GOLD
002B	4822 426 51394	FRONTCOVER (UPPER) BLACK
002B	4822 426 51384	FRONTCOVER (UPPER) GOLD
003B	4822 426 51728	FRONTCOVER BLACK
003B	4822 426 51727	FRONTCOVER GOLD
004B	4822 410 63137	KEYPANEL BLACK
004B	4822 410 63136	KEYPANEL GOLD
008B	4822 450 62205	WINDOW
009B	4822 410 60533	TUNING KEY BLACK
009B	4822 410 60359	TUNING KEY GOLD
015B	4822 410 60194	MAINS KEY BLACK
015B	4822 410 60358	MAINS KEY GOLD
020B	4822 256 92152	DISPLAY HOLDER
901D	4822 426 30143	SIDE PANEL GOLD
902D	4822 444 60607	COVER
003G	4822 462 41932	FOOT
020M	4822 404 21253	MAINS BRACKET
001R	4822 267 31633	COAX CONNECTOR
⚠ 001W	4822 321 22917	MAINS CABLE
	4822 214 52184	IR-RECEIVER
	4822 210 10531	FRONTEND MODEL FE 41
	4822 214 52182	NW MODULE
	4822 210 10595	DSR TUNER
	4822 214 52183	DSR PANEL
	4822 218 10541	REMOTE CONTROL
	4822 736 21998	DIRECT. FOR USE I.F.U.







5. TUNER ALIGNMENT PROCEDURES

5.1 Notes to DSR Board

All adjustment controls on the DSR board are adjusted during production and must not be re-adjusted in the case of repairs.
In case of defect, the DSR board must be changed, due to the extensive and difficult alignements.

5.2 FM Alignment Procedures

(Function switch at "FM" position)

Note:
The frontend is a completely preadjusted module. Only the IF-filter must be adjusted to the IF amplifier.
The values of the tuning voltages are:
87.5 MHz = typ. 1.6 V min 1.3 V
108 MHz = typ. 8.0 V max 9 V

• FM IF Alignment
IF BAND switch at "WIDE" position

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an FM sweep generator to FM aerial socket. U_{RF} = approx. 0.3-1 mV / 75 Ω Δf ± 200 kHz	98 MHz	Connect an oscilloscope to test point ⟨B⟩	With IF filter F1 ⓐ adjust for maximum level and symmetrical position.

• FM Demodulator Alignment
IF BAND switch at "WIDE" position

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an FM generator to FM aerial socket. U_{RF} = 1 mV / 75 Ω Δf ± 40 kHz	98 MHz	Connect a Distortion Analyzer to AF output	With filter F7 ⓘ adjust for minimum distortion. (typ. ≤ 0.12 %)

• FM Field Strength IND - Search Stop Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an FM generator to FM aerial socket. U_{RF} = 1 mV	98 MHz	DC VTVM to test point ⟨F⟩	With R119 Ⓕ set to 1.5 V +0.05 V.
2	Connect an FM generator to FM aerial socket. U_{RF} = 15 µV	98 MHz	DC VTVM to test point ⟨G⟩	With R123 Ⓢ set to 0.7 V +0.05 V.

• Multiplex Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an stereo coder to FM aerial socket.	106 MHz L mod. 1kHz	Connect AC VTVM to AF-output "R"	With R69 Ⓒ adjust for maximum and symmetrical crosstalk attenuation.
2		106 MHz R mod. 1kHz	Connect AC VTVM to AF-output "L"	
3	Connect an AF generator to input F9 (Pin 2) and F11 (Pin 2). U_{AF} = approx. 100mV	19 kHz	Connect AC VTVM to AF-output	With F9 Ⓖ, F11 Ⓗ adjust for minimum level.
4		38 kHz		With F9 Ⓙ, F11 Ⓚ adjust for minimum level.

• Adjacent Channel Filter Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an AF generator to the input of F2 (Pin 2). U_{AF} = approx. 100mV	114 kHz	Connect AC VTVM to the output of F2 (Pin 4).	With F2 Ⓓ adjust for minimum level.

• FM IF offset

The ceramic resonators have different intermediate frequencies as a result of tolerances. Dependent on the IF, a jumper has to be closed or a jumper has to be opened. B0 - B3 (see table).
The resonators have been provided with a colour code.

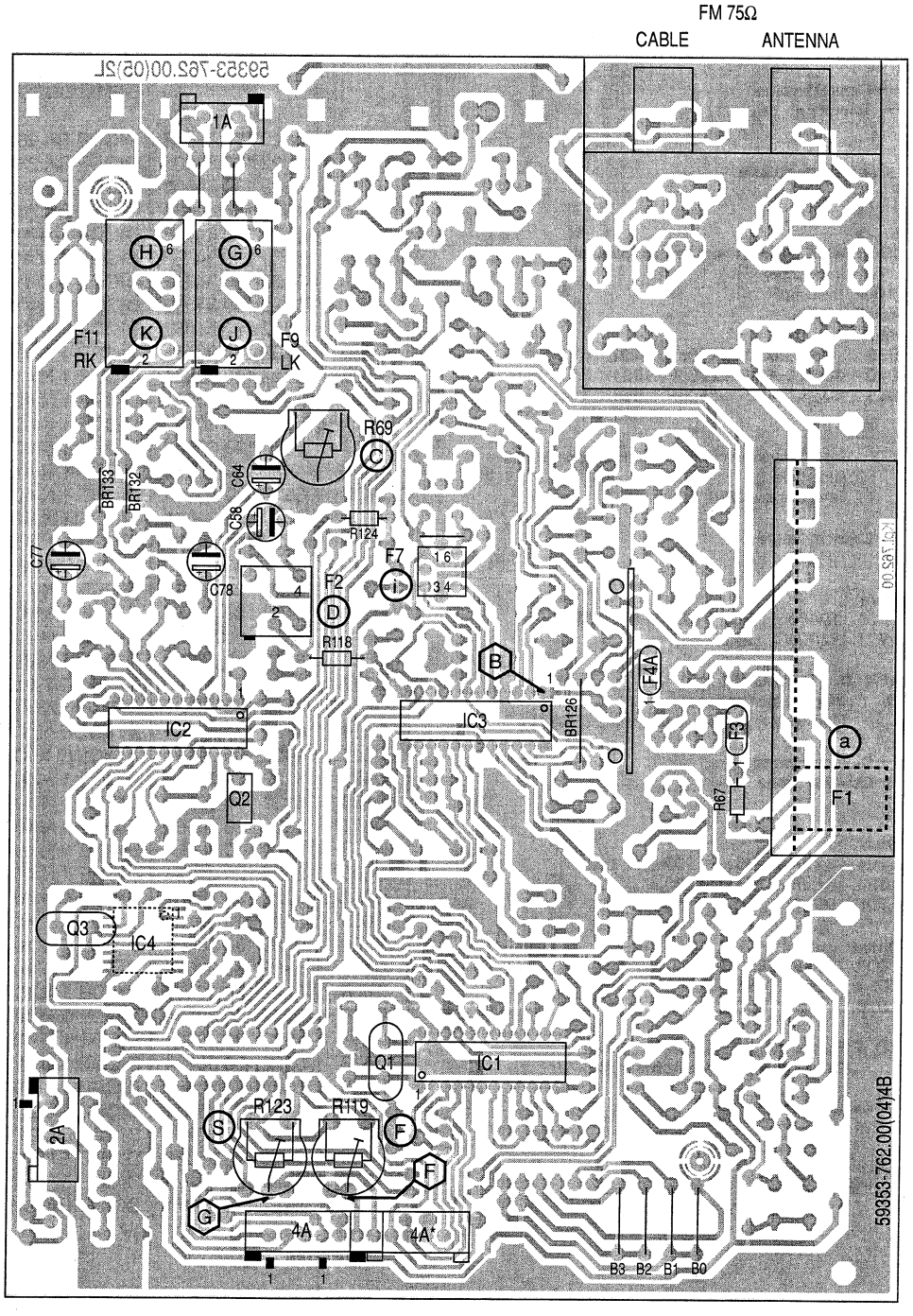
	Jumper				
IF (MHz)	B 3	B 2	B 1	B 0	Filter color
10.6500	0	1	0	0	Black
10.6750	0	1	1	0	Blue
10.7000	1	0	0	0	Red
10.7250	1	0	1	0	Orange
10.7500	1	1	0	0	White

0 = jumper open 1 = jumper closed

⬡ Measuring point

◯ Trimming point

5.3 Alignment Points and Test Points



6. ELECTRICAL PARTS LIST

ASSIGNMENT OF COMMON PARTS CODES.

RESISTOR

R***: (1) GD05---140, Carbon film fixed resistor, ±5%, 1/4W
R***: (2) GD05---160, Carbon film fixed resistor, ±5%, 1/6W

① — Resistance value

Examples

① Resistance value

0.1Ω...001	10Ω...100	1kΩ...102	100kΩ...104
0.5Ω...005	18Ω...180	2.7kΩ...272	680kΩ...684
1Ω...010	100Ω...101	10kΩ...103	1MΩ...105
6.8Ω...068	390Ω...391	22kΩ...223	4.7MΩ...475

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

C***: CERAMIC CAP.
(1) DD1----370, Ceramic condenser
Disc type
①② Temp. coeff. P350 ~ N1000, 50V
Capacity value
Tolerance

Examples

① Tolerance (Capacity deviation)
±0.25pF...0
±0.5pF...1
±5%...5

* Tolerance of COMMON PARTS handled here are as follows:
0.5pF ~ 5pF...±0.25pF
6pF ~ 10pF...±0.5pF
12pF ~ 560pF...±5%

② Capacity value

0.5pF...005	3pF...030	100pF...101
1pF...010	10pF...100	220pF...221
1.5pF...015	47pF...470	560pF...561

C***: CERAMIC CAP.
(1) DK16---300, High dielectric constant ceramic condenser
Disc type
① Temp. chara. 2B4, 50V
Capacity value

Example

② Capacity value

100pF...101	1000pF...102	10000pF...103
470pF...471	2200pF...222	

C***: ELECTROLY CAP. (⧧), FILM CAP. (⧦)
(1) EA------10, Electrolytic condenser
One-way lead type, Tolerance ±20%
①②
Dielectric strength
Capacity value

Examples

① Capacity value

0.1μF...104	4.7μF...475	100μF...107
0.33μF...334	10μF...106	330μF...337
1μF...105	22μF...226	1100μF...108
		2200μF...228

② Working voltage

6.3V...006	25V...025
10V...010	35V...035
16V...016	50V...050

(2) DF15---350, Plastic film condenser
One-way type, Mylar ±5% 50V
①
Capacity value

Examples

① Capacity value

0.001μF (1000pF)...102	0.1μF...104
0.0018μF.....182	0.56μF...564
0.01μF.....103	1μF...105
0.015μF.....153	

REF. DESIG.	PART NO.	DESCRIPTION
		FM TUNER BOARD, MAINS UNIT BOARD, TRANSFORMER BOARD
		CAPACITORS
C505	4822 124 23506	ELCO CB 4700UF 16V
C509	4822 124 23506	ELCO CB 4700UF 16V
C514	4822 124 23506	ELCO CB 4700UF 16V
C519	4822 124 42258	ELCO CB 4700UF 25V
C523	4822 124 42258	ELCO CB 4700UF 25V
		RESISTORS
R69	4822 100 20694	ESTR.SK10-A 100 KOHM
R119	4822 100 20694	ESTR.SK10-A 100 KOHM
R123	4822 100 20694	ESTR.SK10-A 100 KOHM
R527	4822 117 11079	KSW SI B 15 OHM 5%
		SEMICONDUCTORS
D5	4822 130 80638	DIODE BA 282 ITT/SIE/TFK
D8	4822 130 80638	DIODE BA 282 ITT/SIE/TFK
D11	4822 130 80638	DIODE BA 282 ITT/SIE/TFK
D12	4822 130 80638	DIODE BA 282 ITT/SIE/TFK
D14	5322 130 34052	DIODE 1 N 4151 PHI/TFK
D15	5322 130 34052	DIODE 1 N 4151 PHI/TFK
D16	5322 130 34052	DIODE 1 N 4151 PHI/TFK
D17	5322 130 34052	DIODE 1 N 4151 PHI/TFK
D19	5322 130 34052	DIODE 1 N 4151 PHI/TFK
D500	4822 130 30621	DIODE 1 N 4148
D502	4822 130 30621	DIODE 1 N 4148
D503	5322 130 30684	DIODE 1 N 4002
D504	5322 130 30684	DIODE 1 N 4002
D505	5322 130 30684	DIODE 1 N 4002
D506	4822 130 30621	DIODE 1 N 4148
D507	5322 130 30684	DIODE 1 N 4002
D508	4822 130 30621	DIODE 1 N 4148
D509	5322 130 30684	DIODE 1 N 4002
D510	4822 130 31983	DIODE BAT 85
D511	4822 130 30621	DIODE 1 N 4148
D513	4822 130 82754	Z DIODE 33 C 0,5W
D514	5322 130 30684	DIODE 1 N 4002
D515	5322 130 30684	DIODE 1 N 4002
D517	4822 130 80515	Z DIODE 5,1 C 0,5W
D518	4822 130 30621	DIODE 1 N 4148
D519	4822 130 33784	Z DIODE 15 C 0,5W
D521	4822 130 31024	Z DIODE 18 C 0,5W
D522	5322 130 30684	DIODE 1 N 4002
D523	5322 130 30684	DIODE 1 N 4002
D601	5322 130 30684	DIODE 1 N 4002
D602	5322 130 30684	DIODE 1 N 4002
D603	5322 130 30684	DIODE 1 N 4002
D604	5322 130 30684	DIODE 1 N 4002
D605	5322 130 30684	DIODE 1 N 4002
D606	5322 130 30684	DIODE 1 N 4002
D607	5322 130 30684	DIODE 1 N 4002
D608	5322 130 30684	DIODE 1 N 4002
D609	5322 130 30684	DIODE 1 N 4002
D611	5322 130 30684	DIODE 1 N 4002
D612	5322 130 30684	DIODE 1 N 4002
D613	5322 130 30684	DIODE 1 N 4002
D801	4822 130 30971	DIODE BA 243
D802	4822 130 30971	DIODE BA 243
D803	5322 130 34052	DIODE 1 N 4151 PHI/TFK
D804	4822 130 30971	DIODE BA 243
D805	4822 130 30971	DIODE BA 243

REF. DESIG.	PART NO.	DESCRIPTION
		FM TUNER BOARD, MAINS UNIT BOARD, TRANSFORMER BOARD
		SEMICONDUCTORS
IC1	4822 209 30178	IC LC 7218 SANYO MOS
IC2	4822 209 73434	IC LA 3401 MOS
IC3	4822 209 71785	IC LA 1266 MOS
IC4	4822 209 31981	IC SAA 6579 T PHI MOS
IC501	4822 209 63277	IC 78M05 2%
IC502	5322 209 11222	IC MC 7905 CT MOT/CU PHI
IC503	4822 209 80591	IC LM 317 T NSC/MOT
IC504	4822 209 80591	IC LM 317 T NSC/MOT
IC505	5322 209 81236	IC LM 337 T
T6	4822 130 44197	TRANS.BC 558 B
T7	4822 130 42121	TRANS.2 SK 30 A-TM-Y
T12	4822 130 44196	TRANS.BC 548 C
T13	4822 130 44197	TRANS.BC 558 B
T16	4822 130 40902	TRANS.BF 240
T23	4822 130 40937	TRANS.BC 548 B
T504	4822 130 44197	TRANS.BC 558 B
T505	4822 130 40937	TRANS.BC 548 B
T506	4822 130 44197	TRANS.BC 558 B
T507	4822 130 40937	TRANS.BC 548 B
T508	5322 130 44647	TRANS.BC 368
T509	4822 130 40937	TRANS.BC 548 B
T801	4822 130 40902	TRANS.BF 240
T802	4822 130 40937	TRANS.BC 548 B
T803	4822 130 44197	TRANS.BC 558 B
		MISCELLANEOUS
F2	4822 214 51727	FILTER
F3	4822 242 81711	CERAMIC-FILTER 180
F7	4822 156 11092	FM-DEM.I
F9	4822 156 11104	FILTER (PILOT)LPF-V20
F11	4822 242 81709	CERAMIC-FILTER 160/149
F801	4822 242 81707	CERAMIC-FILTER 90
⚠ L001	4822 146 31007	MAINS TRAFO
L3	4822 157 62299	DR AX 0309-GA 3.3UH
L4	4822 157 62299	DR AX 0309-GA 3.3UH
L5	4822 157 62299	DR AX 0309-GA 3.3UH
L6	4822 157 70177	DR AX 0411-GA 2.2UH
L7	4822 157 62299	DR AX 0309-GA 3.3UH
L16	4822 157 70423	DR AX 0207-GA 0.33UH
L21	4822 157 70178	DR AX 0309-GA 22UH
Q1	4822 242 72294	QUARZ 7,2 MHz
Q2	4822 242 72295	CER.RES.10 CSB 456 F11
Q3	4822 242 81319	QUARZ 4.332 MHz
⚠ S1	4822 276 13496	MAINS SWITCH
⚠ S000	4822 252 20211	THERMO FUSE
⚠ SI601	4822 70 31002	FUSE 1 A/T L 250V
⚠ SI602	4822 70 31002	FUSE 1 A/T L 250V
⚠ SI603	4822 70 31002	FUSE 1 A/T L 250V
⚠ SI604	4822 70 31002	FUSE 1 A/T L 250V
	4822 210 10531	FRONTEND MODEL FE 41
	4822 214 52182	NW MODULE
	4822 210 10595	DSR TUNER
	4822 214 52183	DSR PANEL
	4822 218 10541	REMOTE CONTROL
	4822 736 21998	DIRECT. FOR USE I.F.U.

REF. DESIG.	PART NO.	DESCRIPTION
		OPERATION BOARD
		SEMICONDUCTORS,
D1	4822 130 30621	DIODE 1 N 4148
D2	4822 130 34189	DIODE BAV 20
D3	4822 130 34189	DIODE BAV 20
D4	4822 130 34173	Z DIODE 5,6 C 0,5W
IC1	4822 209 33277	IC M 38174
IC2	5322 209 84479	IC SN 74164
IC3	4822 209 33276	IC ST 24 C 16
T1	4822 130 44197	TRANS.BC 558 B
T2	4822 130 40937	TRANS.BC 548 B
T3	4822 130 44197	TRANS.BC 558 B
T4	4822 130 44197	TRANS.BC 558 B
T5	4822 130 40937	TRANS.BC 548 B
		MISCELLANEOUS
DP1	4822 130 91334	DISPLAY
IR1	4822 214 52184	IR-RECEIVER
Q1	4822 242 81708	CER.RES.100 6 MHz
S00	4822 410 62446	BUTTON, PUSH SWITCH

NOTE ON SAFETY:
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.